TEK SERVICE MANUAL
VOLUME 2

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Product Group 11

4113
COMPUTER DISPLAY TERMINAL

Please Check for
CHANGE INFORMATION
at the Rear of this Manual

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MANUAL REVISION STATUS

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This manual supports the following versions of this product: Serial Numbers B010100 and up.

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Figure 1-1. The 4113 Computer Display Terminal.

Section 1

INTRODUCTION

ABOUT THIS MANUAL

The 4113 Computer Display Terminal Service Manual is divided into two volumes. Volume 1 includes introductory information, characteristics, operating information, maintenance, adjustment, and circuit theory information. Volume 1 is primarily a reference manual.

Volume 2, on the other hand, contains frequently used information that the service technician needs to trouble-shoot, repair, and adjust the terminal. This information includes an abbreviated adjustment procedure, electrical and mechanical parts lists, block, interconnect, and schematic diagrams, installation information, reference tables and charts, and a detailed explanation of Self Test (a built-in, trouble-shooting program located in firmware in in the terminal).

These two manuals cover servicing for the pedestal and desk only. The display module has its own separate service manual. For servicing information on the display, consult the 4113 Display Module Service Manual. The 4110 Series Desk Configuration Service Manual provides additional information on mechanical servicing of the 4113-30 desk configuration.

RELATED DOCUMENTS

Detailed information on the use of the 4113 terminal is found in the following documents.

- 4113 Introduction Brochure
- 4113 Computer Display Terminal Operator's Manual
- 4113 Host Programmers Reference Manual
- 4110 Series Command Reference Manual

In addition, some 4113 options have their own separate manuals. Consult the following if needed.

- 4110 Series Option 02 Current Loop Interface Instruction Manual.

- o 4110 Series Option 10 Three Port Peripheral Interface Instruction Manual.
- o 4110 Series Option F13/14 Graphic Tablet Instruction Manual.
- o 4110 Series F42/43 Disk Options Service Manual.
- o 119-0977-01/03 Flexible Disk Drive Instruction Manual.

4113 GENERAL DESCRIPTION

The 4113 is a microprocessor controlled color graphics computer terminal capable of doing complex local graphics, and manipulating and storing these graphics locally. It can come in two basic models, a pedestal model (4113) or a desk model (4113-30). Figure 1-1 shows the 4113 and Figure 1-2 shows the 4113-30 Desk Configuration. Both models are electrically identical with the only difference being mechanical packaging. Both models are capable of hosting the full range of 4113 options. The display for both models is a 19-inch diagonal color raster-scan crt.

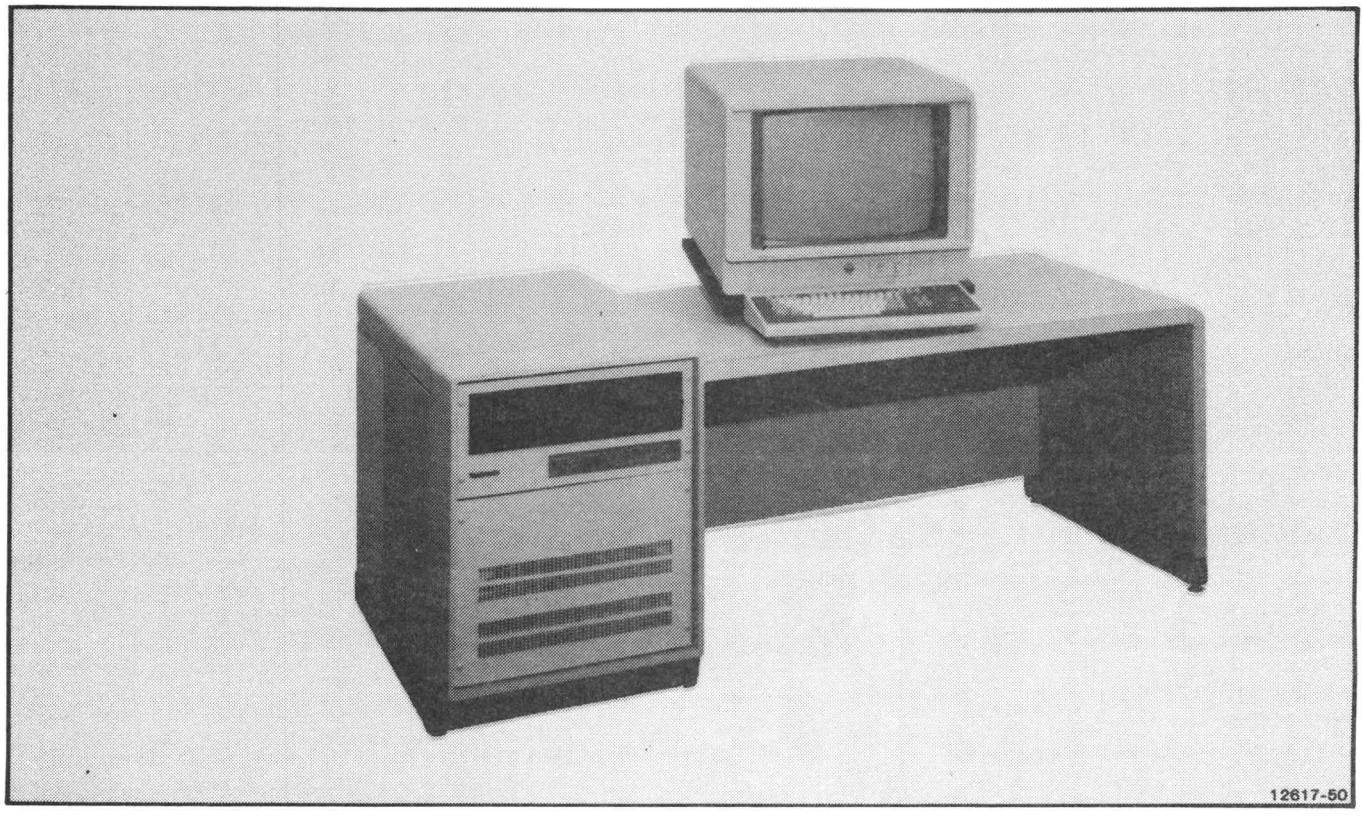


Figure 1-2. The 4113-30 Desk Configuration.

The standard 4113 has 32K bytes of RAM (read/write) memory with up to 512K of optional RAM available. Up to 800K bytes of RAM may be installed if other optional circuit boards are not using the processor bus slots in the card cage. As much as 1 Megabyte of data can be stored and locally used on the two optional floppy disk drives (512K bytes per disk). The maximum host computer-terminal communications speed ("baud rate") is 9600 bits per second (bps) for graphics.

In addition to the commands which communicate with the host computer, the terminal has a feature called Set up mode. Set up mode uses English-language type commands to initialize many terminal operating parameters locally. Three of the major classifications of Set up commands are: general, dialog, and communications. In the general group, parameters like margin, echo, and Snoopy mode are set. In the dialog group, parameters like buffer size, line width, and number of lines are set. And in the communications group, parameters such as the number of stop bits, type of parity, and end-of-line string are set.

Most commands for the 4113 are encoded as three character ASCII codes beginning with the ESC character. The host computer controls the terminal by sending it these three character ESC sequences in the order determined by each specific job to be done. (The Set-Up mode commands are encoded both as English language type commands and as ESC sequences.)

In addition, the 4113 has a built-in self-diagnostics system, Self Test. Self Test uses messages displayed on the screen, the keyboard bell, and the keyboard LEDs to inform the servicing technician that an error has occured. Error codes provide the technician with a valuable tool in locating most malfunctions.

4113 PHYSICAL DESCRIPTION

The 4113 consists of two main parts: the display module and either the pedestal (pedestal model) or the desk (desk model).

The display module contains a 19-inch diagonal color raster-scan crt and the electronics (convergence boards, High Voltage board, etc.) to drive it. The display module electronics are covered in a separate manual.

With the pedestal model, the display module rests directly on top of the pedestal. The display module and pedestal are connected by five cables-the AC power cable, the display power control cable, and three BNC to BNC connector cables (one each for red, green, and blue composite video).

The pedestal contains the keyboard, the low voltage power supply, the card cage, and six mounting plates on the rear panel. The card cage contains a number of plug-in circuit boards.

With the desk model (4113-30), the display sits on top of the desk on a plate that can both swivel and tilt. This plate may be placed anywhere on the top of the desk. In this way, the display can be adjusted for maximum user comfort. The desk is connected to the display by the same five cables that connect the display to the pedestal (AC power cord, display power control cable, and three BNC-to-BNC connectors). The desk keyboard is detached and is not a rigid part of the desk. In this way, the keyboard can be moved to accomodate the user. The keyboard key configuration is identical to that of the pedestal.

All desk electronics (with the exception of the keyboard) are located inside one side of the desk. This can either be on the left side or right side of the user, depending on how the desk is assembled during installation of the terminal. The desk electronics are identical to the pedestal. The desk, like the pedestal, also has a keyboard, low voltage power supply, card cage, and 6 mounting plates on the rear panel.

The keyboard for both the pedestal and desk is a standard typewriter-like layout of ASCII encoded keys. In addition, there are eight programmable and four command keys, as well as the four keys used for the zoom and pan controls. Four LED indicator lights are situated above the standard ASCII keys. These lights are KBD LOCK (keyboard lock), PAGE FULL, XMT (transmit), and RCV (receive). In addition, these lights are used to denote error codes when running Self-Test. There are also two thumbwheels--one controlling vertical motion on the screen, the other controlling horizontal motion on the screen.

CONTROLS AND INDICATORS

The 4113 pedestal model and the 4113-30 desk model have the same operating controls, but some are in slightly different locations. Figure 1-3 shows the location of these controls. A description follows.

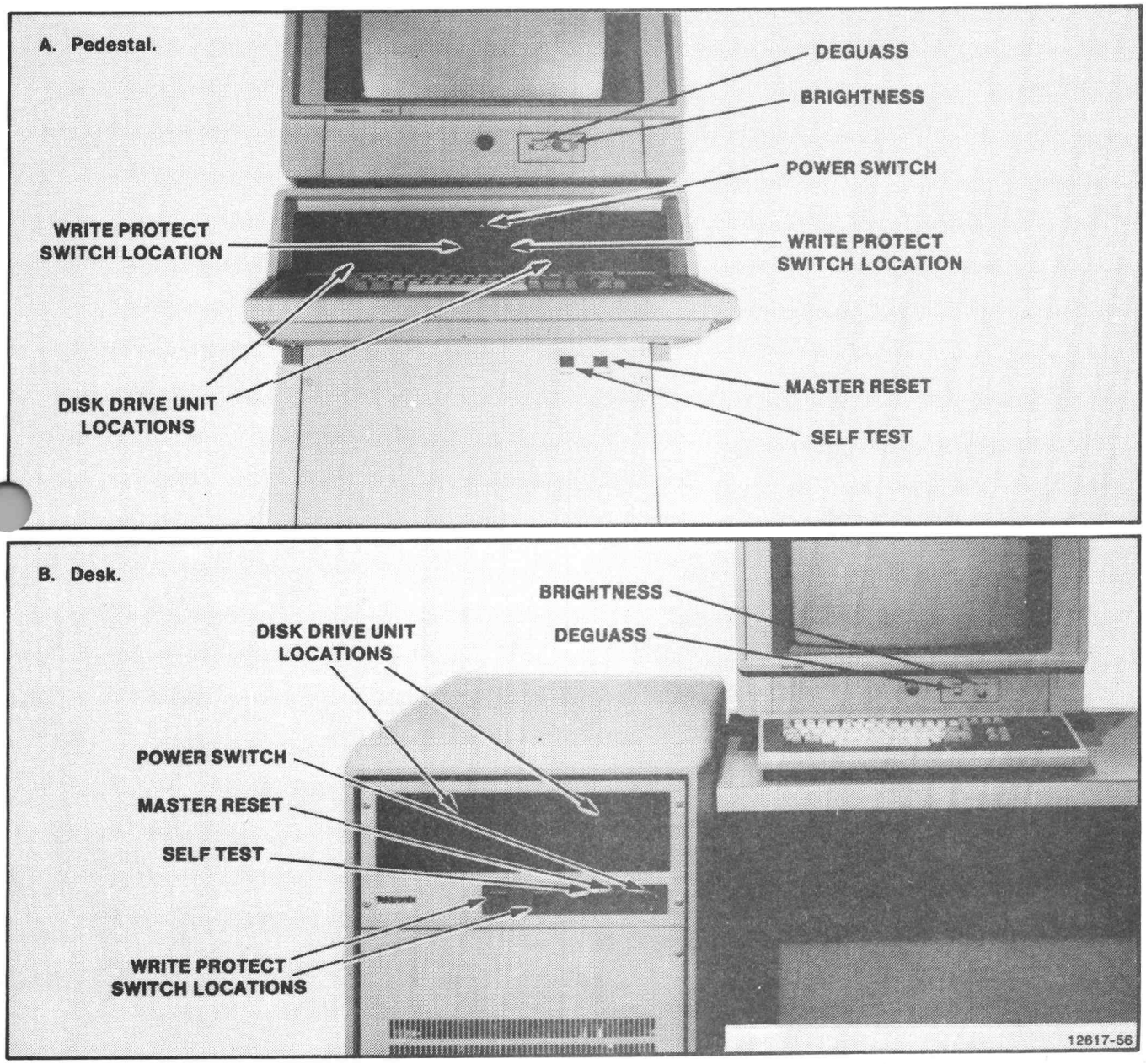


Figure 1-3. Controls and Indicators.

Power Switch	Located on the front of the 4113 on both models. To turn on the power to the terminal, push in and release.
Disk-Drive Unit	One or two disk drives may be located on either side of the power switch (on the pedestal), or above the power switch (on the desk). The unit busy light, an LED in the center of the door on the release switch, is on whenever the unit is energized. The release switch is pushed to open the door. As the door opens, a spring ejects the disk.

CAUTION

Do not attempt to remove or insert a disk while the unit busy light is on. To do so may cause irreparable damage to the disk, the read/write heads of the unit, loss of the program on the disk, or all three.

Write Protect Switch	A rocker switch next to the disk drive drawer (pedestal) or below the disk drive drawer (desk). The LED indicator light is on when the write protect is enabled.
Self Test Button	Initiates the Self Test sequence of the terminal when used with MASTER RESET. The SELF TEST button does nothing by itself. Located to the left of MASTER RESET button. The SELF TEST button and the Self Test sequence is discussed in detail in Appendix D.
Master Reset Button	By itself, it resets the terminal to the default status (the same as powering up). When used with the SELF TEST button, it resets the terminal for a Self Test sequence.
Brightness Control	The BRIGHTNESS control on the front of the display module controls the intensity of the data being viewed.

Deguass Switch

The DEGUASS switch on the front of the display module activates a deguassing coil in the display. This deguassing coil demagnetizes the frame and chassis of the display. When the frame and chassis are magnetized, the color at the edges of the screen may not be consistant with the color at the center of the screen (the color is not uniform). When this occurs, it is time to use the DEGUASS control.

THE KEYBOARD

Most of the keys on the keyboard are the same as a typewriter (Figure 1-4). Other keys have default functions upon power up, while still other keys are left for the operator to program.

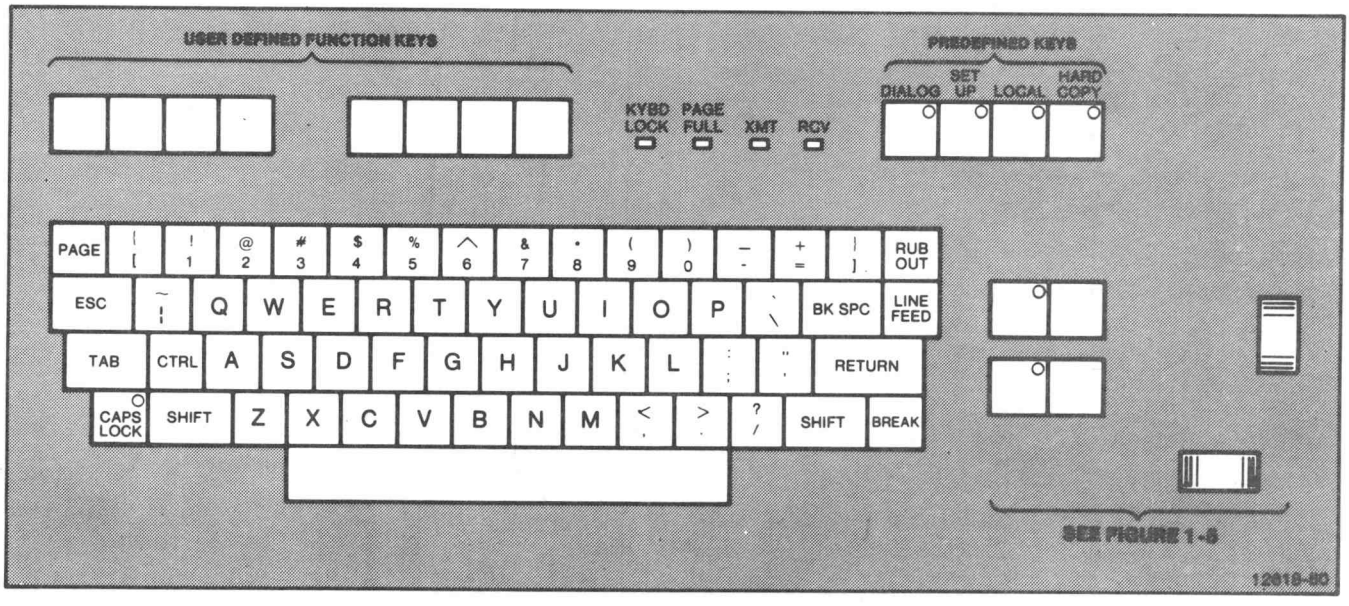


Figure 1-4. Keyboard Layout.

Five of the predefined keys have the following functions:

DIALOG/CLEAR

DIALOG causes the dialog area to be displayed. It is in use when the key is lit. CLEAR is the shifted function of the DIALOG key. It erases the dialog area.

SET UP	SET UP enables the terminal to receive commands. Set up mode has priority over local mode.
LOCAL/CANCEL	LOCAL places the terminal under local control. When Local mode is selected, the host has no effect and local echo is employed. CANCEL is the shifted version of the LOCAL key. It cancels anything the terminal is presently doing (except for spooling).
HARD COPY	The contents of the screen are sent to a hard copy unit if one is attached. Shift HARD COPY gives a "reverse video" of the display.
CAPS LOCK	CAPS LOCK causes alphabetic characters to be displayed in upper-case, but does not affect numeric or special symbol keys.

The Viewing Keys

The four keys adjacent to the thumbwheels (Figure 1-5) are the viewing keys, and, with the thumbwheels, are used to manipulate a graphics segment. More information on these keys will be found in the 4113 Operator's Manual. The predefined meanings of these keys and thumbwheels follows:

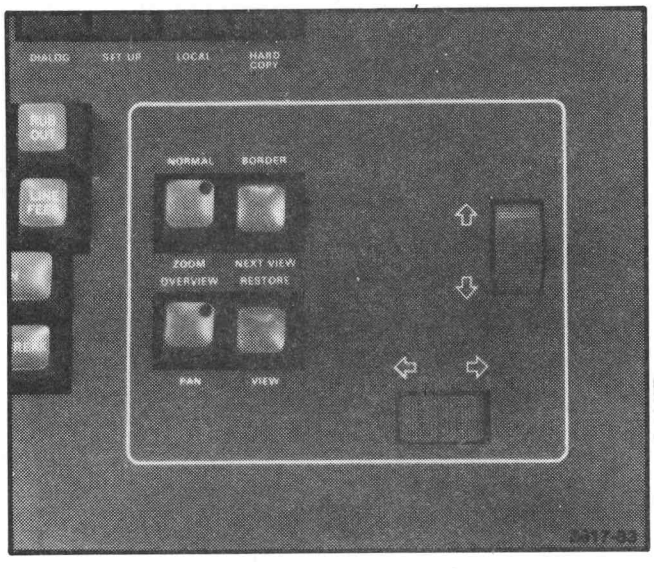


Figure 1-5. Viewing Keys and Thumbwheels.

ZOOM/NORMAL	ZOOM allows focusing on a peticular area of the total image. NORMAL restores the normal aspect ratio if it was distorted during zoom and pan operations. To change the aspect ratio, enter zoom and press CTRL while moving the thumbwheels.
PAN/OVERVIEW	PAN permits changing the point of view. OVERVIEW permits viewing of the entire image and shows the area being panned or zoomed with a framing box.
NEXT VIEW/BORDER	NEXT VIEW activates the viewport. If more than one viewport is enabled, NEXT VIEW looks at the next viewport. CTRL-NEXT VIEW looks back one viewport. BORDER causes a border to appear or disappear around the current viewport.
VIEW/RESTORE	VIEW updates the view to what is in the current framing box. RESTORE restores the original view of the current viewport.

CIRCUIT BOARDS AND ASSEMBLIES

The standard 4113 pedestal/desk contains the following circuit boards and assemblies:

- Mother board. This circuit board has slots for 16 standard size circuit boards. The Mother board contains two system buses, the processor bus and the raster bus.
- Processor board. Contains a 8086 microprocessor which is the heart of the system.
- Keyboard (detached on the desk model).
- RAM/ROM board. This board contains the system EPROM and one 32K RAM Array board.
- Video Controller board.
- Vector Generator board.
- Dual Plane Raster Memory board.

- Single Plane Raster Memory board.
- Color Map board.
- Display Interconnect board. This board contains the BNC connectors a phone jack to route signals to the display.
- Low Voltage Power Supply. The low voltage power supply contains an Inverter board and a Regulator board.

The Processor, RAM/ROM, Video Controller, Vector Generator, Raster Memory Planes, and Color Map boards are mounted in the card cage and plug into the Mother board. Figure 1-6 shows the proper circuit board placement in the Card Cage. The Display Interconnect board is mounted on the rear panel of the pedestal/desk and provides the connectors to route composite video signals to the display.

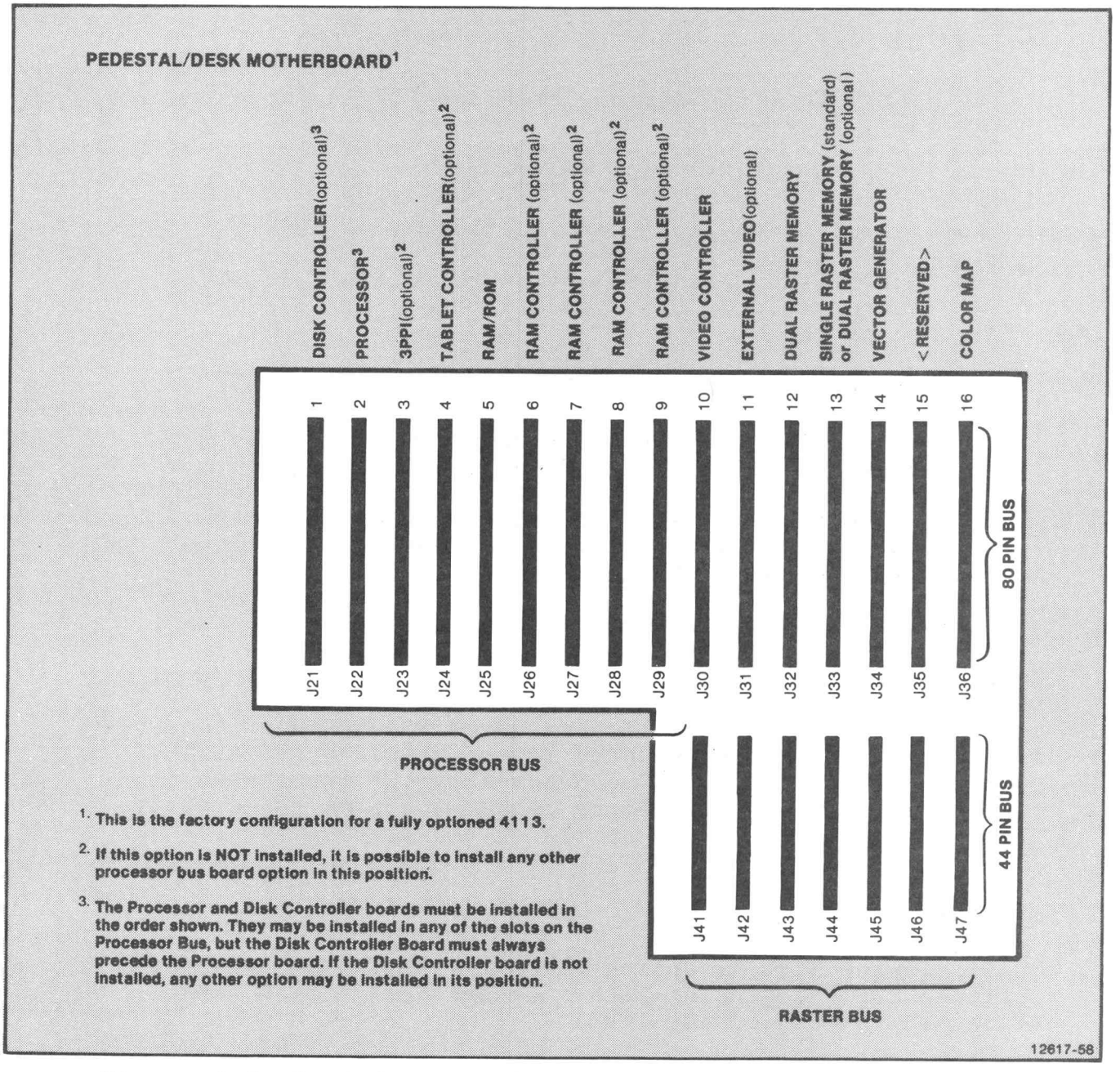

PEDESTAL/DESK MOTHERBOARD[1]
DISK CONTROLLER(optional)[3]
PROCESSOR[3]
3PPI(optional)[2]
TABLET CONTROLLER(optional)[2]
RAM/ROM
RAM CONTROLLER (optional)[2]
RAM CONTROLLER (optional)[2]
RAM CONTROLLER (optional)[2]
RAM CONTROLLER (optional)[2]
VIDEO CONTROLLER
EXTERNAL VIDEO(optional)
DUAL RASTER MEMORY
SINGLE RASTER MEMORY (standard) or DUAL RASTER MEMORY (optional)
VECTOR GENERATOR
<RESERVED>
COLOR MAP
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
J21 J22 J23 J24 J25 J26 J27 J28 J29 J30 J31 J32 J33 J34 J35 J36
80 PIN BUS
PROCESSOR BUS
J41 J42 J43 J44 J45 J46 J47
44 PIN BUS
RASTER BUS
1. This is the factory configuration for a fully optioned 4113.
2. If this option is NOT installed, it is possible to install any other processor bus board option in this position.
3. The Processor and Disk Controller boards must be installed in the order shown. They may be installed in any of the slots on the Processor Bus, but the Disk Controller Board must always precede the Processor board. If the Disk Controller board is not installed, any other option may be installed in its position.
12617-58

Figure 1-6. Card Cage and Proper Circuit Board Placement.

The 4113 may contain these optional circuit boards:

- Current Loop Interface Board (Option 02)
- Three Port Peripheral Interface (3PPI) board (Option 10).
- External Video board (Option 12).
- Tablet Controller board (Option 13 or 14).
- Dual Plane Raster Memory board (Option 21). This board replaces the standard Single Plane Raster Memory Board.
- RAM Controller board (Options 24 through 29). Up to four RAM Controller boards may be installed, each containing up to four RAM Array boards. Each RAM Array board contains 32K bytes of RAM. Up to six RAM Controller boards may be installed if some options are not installed (this makes extra slots available on the processor bus). Up to 800K bytes of local RAM may then be addressed.
- Disk Controller board (Option 42 or 43).

There are six removable mounting plates on the rear panel of the pedestal/desk. Two are standard and four hold optional connectors or L-brackets. The standard RS-232C host computer interface connector is mounted to the standard plate. The video connectors (five BNC connectors), the monochrome hard copy connector, and a miniture phone jack (for the display power control) is mounted on the second plate.

OPTIONS

The following list of options is placed in numerical order. Option numbers beginning with a letter designation are placed at the end of the list.

Option 01	Extended Communications (includes half-duplex and Block mode).
Option 02	Current Loop Interface (see the Current Loop Interface Service Manual for detailed service information).

Option 4A	United Kingdom Keyboard.
Option 4C	Swedish Keyboad.
Option 4E	APL Keyboard.
Option 4F	Danish/Norwegian Keyboard.
Option 10	Three Port Peripheral Interface (3PPI). This option supports the following peripheral devices: 4662 and 4663 Plotters 4640 Series Printers 4923 Tape Recoder with Option 01 installed Option hardware includes a rear panel connector and the 3PPI board.
Option 12	External Video. Provides Video signals to drive an external source. Option hardware includes a rear panel connector and the External Video board.
Option 13	Graphic Tablet. Size: 11" x 11". Option hardware includes: Graphic Tablet (and pen), 411X Tablet Controller board, and Tablet Interface board. Details are found in the 4110 Series F13/14 Graphics Tablet Instruction Manual and the 4113 Operators Manual.
Option 14	Graphic Tablet. Size: 30" x 40". Option hardware includes: Graphic Tablet (and pen), 411X Tablet Controller board, and Tablet Interface board. See the 4110 Series F13/14 Graphics Tablet Instruction Manual and the 4113 Operators Manual.
Option 21 (*)	Dual Plane Raster Memory Board. Increases the number of available bit planes from three to four. Increases the amount of available colors for viewing from eight to 16.

(*) This option is not field installable.
NOTE--Some of the line voltage options may also require special power cords.

Option 24	Additional 32K Bytes of RAM. Includes one RAM Controller board with one RAM Array board installed.
Option 25	Additional 64K Bytes of RAM. Includes one RAM Controller board with two RAM Array boards installed.
Option 26	Additional 96K Bytes of RAM. Includes one RAM Controller board with three RAM Array boards installed.
Option 27	Additional 128K Bytes of RAM. Includes one RAM Controller board with four RAM Array boards installed.
Option 28	Additional 256K Bytes of RAM. Includes two RAM Controller boards with eight RAM Array boards installed.
Option 29	Additional 512K Bytes of RAM. Includes four RAM Controller boards with sixteen RAM Array boards installed.
Option 42	Single Flexible Disk Drive and one Disk Controller Board. The service information for this Option is located in the 4110 Series F42/43 Disk Options Service Manual and the 119-0977-01/03 Drive Unit Service Manual.
Option 43	Dual Flexible Disk Drive and one Disk Controller Board. The service information for this Option is located in the 4110 Series F42/43 Disk Options Service Manual and the 119-0977-01/03 Drive Unit Service Manual.
Option 52	Customer specified line voltage and frequency.
Option A1	Universal European line voltage and frequency: 220 V, 50 Hz.
Option A2	United Kingdom line voltage and frequency: 240 V, 50 Hz.

Option A3	Australian line voltage and frequency: 240 V, 50 Hz.
Option A4	North American line voltage and frequency: 240 V, 60 Hz.
Option A5	Swiss line voltage and frequency: 220 V, 50 Hz.

ACCESSORIES

This list is divided into two parts: the standard accessories that are supplied with each 4113, and those accessories that may be ordered separately in addition to the standard accesories. The following accessories are also found in the parts list, where part numbers are listed for each item.

Standard Accessories:

- 4113 Introduction Manual
- 4113 Operator's Manual
- Power cord set
- Host port RS-232 cable
- Eight relegendable key caps
- Six function-key overlays
- 4113 Host Programmer's Manual
- 4110 Series Command Reference Manual
- Display interconnect cables
- Two convergence drawer keys

Optional Accessories:

- 41XX Logic Extender board
- Relegendable key caps
- Function-key overlays
- RS 232 Loop-back connector
- 4113 Service Manual, Volume 1
- 4113 Service Manual, Volume 2
- 4113 Display Module Service Manual
- 4110 Series Option 10 (3 PPI) Service Manual (when Option 10 is installed)
- 4110 Series F13/14 Graphics Tablet Instruction Manual (when Option 13 or 14 is installed)
- 4110 Series F42/43 Disk Options Service Manual (when Option 42 or 43 is installed)
- 119-0977-01/03 Flexible Disk Drive Instruction Manual (when Option 42 or 43 is installed)
- 4110 Series Desk Configuration Service Manual (when the terminal is a 4113-30)
- 067-1107-00 Test Graticule

Section 2

ADJUSTMENT PROCEDURES

INTRODUCTION

This section contains abbreviated and detailed adjustment procedures for the pedestal/desk only (without options installed). Since the 4113 pedestal model and the 4113 desk model function the same and contain the same electronics, the adjustment procedure is the same for both. The adjustment procedure for the display module is found in the 4113 Display Module Service Manual. If options are installed in the terminal, slightly different (or additional) adjustment procedures may be required. If the terminal has any options installed, the service manuals for those options should be checked for variations on, or additions to, this adjustment procedure. The pedestal/desk should always be adjusted before adjusting the display module, so that the vector generation and resulting display measurements are correct for display adjustment.

ABBREVIATED ADJUSTMENT PROCEDURE

The abbreviated adjustment procedure precedes the detailed adjustment procedure.

NOTE

This abbreviated adjustment section is NOT a complete adjustment procedure. It does, however, serve as a checklist for the experienced service technician. For the complete adjustment procedures refer to the "Pedestal/Desk Adjustment Procedure". THIS ABBREVIATED ADJUSTMENT SECTION DOES NOT CONTAIN "NOTES," "CAUTIONS," OR "WARNINGS."

Abbreviated Pedestal/Desk Adjustment

Gather the equipment necessary for adjusting the terminal, make sure the terminal is operating under performance specifications, remove the pedestal/desk front panel, and do an inspection with the power off.

Low Voltage Power Supply

1. Install the 41XX Logic Extender board. (This board contains the test points needed for the power supply checks).

2. Check the +5.1 V supply (R685 adjustment) at TP 75 to make sure that the voltage lies within the tolerance of +5.105 V to +5.115 V.

3. Check the +12.00 V supply at TP 79 to make sure that the voltage lies within the tolerance of +11.88 V to +12.12 V.

4. Check the -5.2 V supply at TP 5 to make sure that the voltage lies within the tolerance of -5.05 V to -5.35 V.

5. Check the -12.00 V supply at TP 1 to make sure that the voltage lies within the tolerance of -11.88 V to -12.12 V.

6. Check the power supply ripple on the +5.1, +12.00, -12.00, and the -5.2 V supplies. All ripple should be below 100 mV.

INIT and PFAIL

1. Check for the INIT waveform at TP9 and the PDWN-INIT waveform at TP 75 during the power up and power down sequences.

2. Check for the PFAIL waveform at TP 7.

3. Turn off the terminal and remove the extender board, replace the cover.

PEDESTAL/DESK ADJUSTMENT PROCEDURE

Introduction to the Pedestal/Desk Adjustment Procedure

The following procedure adjusts the pedestal/desk for optimum performance. For continued optimum performance of the terminal, check--and adjust if necessary--both the pedestal and display module every 1000 hours of operation or every twelve months if the terminal is used infrequently.

NOTE

If the display module is to be adjusted, this procedure must precede the display module adjustment procedure. If this is not done, the display module may not operate to its full performance capabilities.

Since most of the pedestal/desk circuitry is digital, very little adjustment is required. The only adjustments in the pedestal/desk are power supply adjustments.

Test Equipment Required

- Oscilloscope (TEKTRONIX 465 or equivalent). Dual trace with a vertical deflection factor of at least 5 mV per division, and a sweep rate of at least 10 ns per division.
- Two 10X oscilloscope probes with 50 ohm terminators.
- One 1X oscilloscope probe to be used for external triggering.
- Digital Voltmeter (DVM) (TEKTRONIX DM 501 or equivalent). Range of -30 V to +30 V with at least 0.1% accuracy. This meter needs a range of -30V to +600V for adjusting the display module, if it is to be used for the display module adjustment procedure too.

- Adjustment tool. Non-conductive. One small screwdriver about 5.0 inches in overall length.
- Power module (TEKTRONIX TM 503 or equivalent). Needed if a TEKTRONIX DM 501 digital multimeter is used.
- Set of hand tools for hardware adjustment checks. Should include nut drivers, screwdrivers, etc.
- 41XX Logic Extender board (TEKTRONIX part number 067-1005-00).
- Small flash light--such as a penlight.

Performance Conditions

The following three conditions must be met before the pedestal/desk can be adjusted properly. They must also be met before the characteristics and performance specifications are valid.

- The pedestal/desk must be adjusted at room temperature--20 to 30 degrees C (68 to 86 degrees F).
- The pedestal/desk must be connected to the display module by the AC Display Power Cord, the Display Power Control cable, and the three BNC-to-BNC coaxial cables.
- The terminal--both pedestal/desk and display module--must have power applied for at least 20 minutes.

Inspection

WARNING

Hazardous voltages are present in the terminal circuitry. Always use proper servicing techniques to avoid being injured. Only qualified service technicians should perform the following inspection procedure. Before doing this inspection procedure, MAKE SURE THE POWER CORD IS DISCONNECTED FROM THE AC POWER OUTLET.

1. Remove the front cover from the front of the pedestal/desk. This is done by loosening the screws shown in Figure 2-1 and gently pulling forward on the cover. There are two press-fit fasteners at the top of the front panel of the pedestal.

2. Check for loose, damaged, or improperly mounted hardware.

3. Make sure that circuit boards are installed in the correct slots. The placement of the circuit boards is shown in Figure 2-2.

4. Make sure that board level numbers are correct and that circuit modifications are installed correctly.

5. Make sure that all the ground straps going to all the rear connectors are screwed tightly to the chassis.

6. Check all wiring, ribbon cables, and harmonica connectors for proper installation.

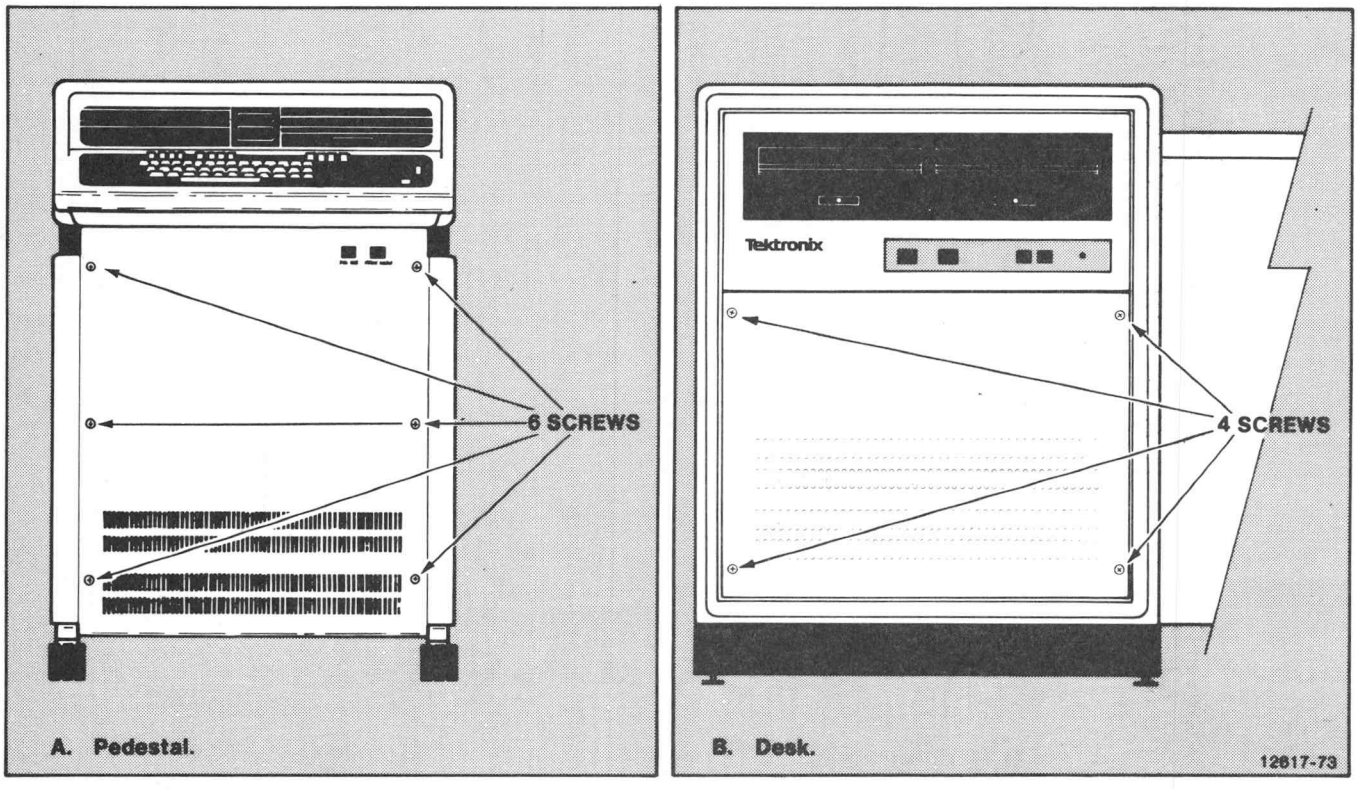


Figure 2-1. Front Cover Screw Locations.

7. Check edge connectors and Mother board insert connectors for damage.

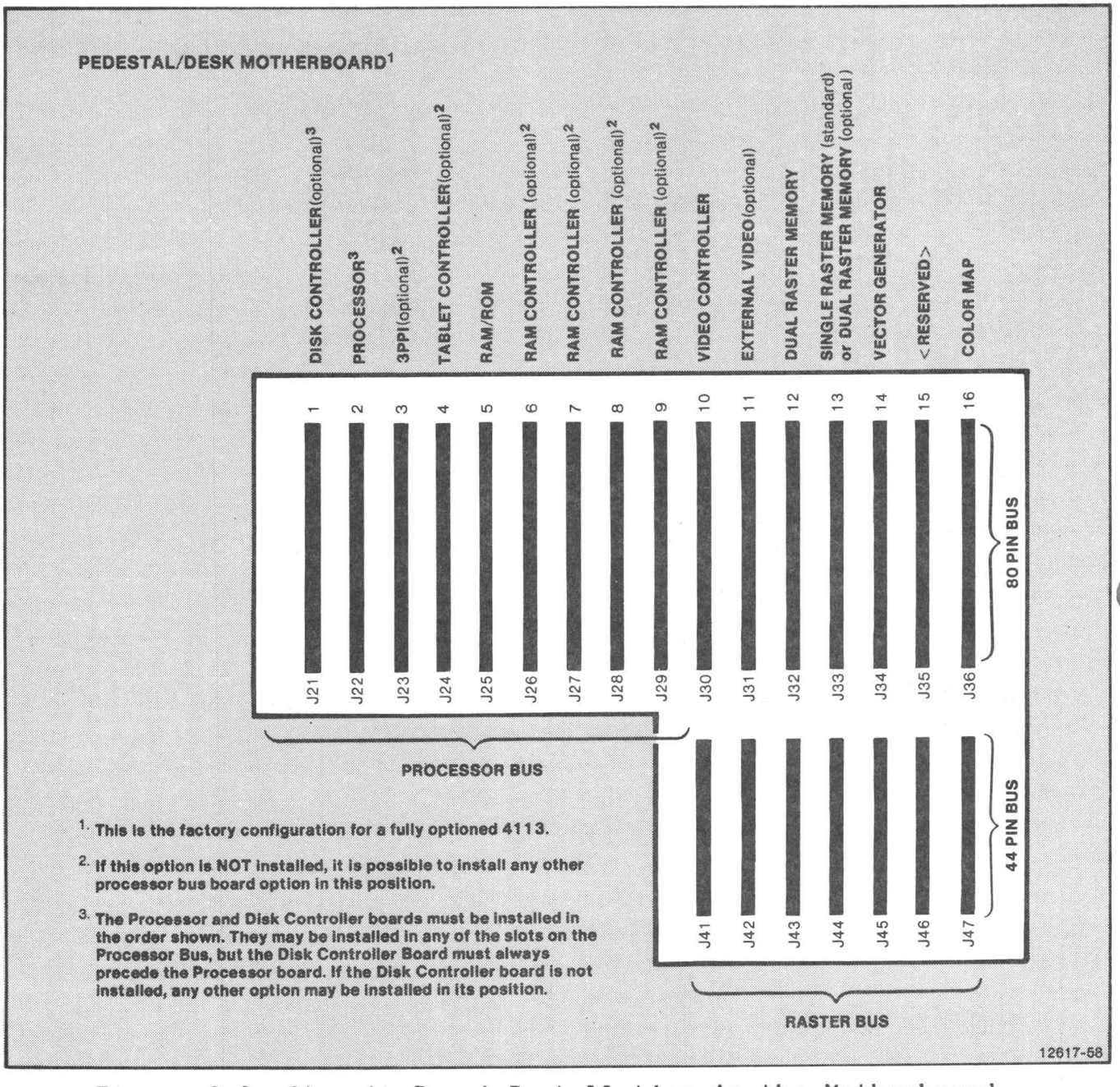

PEDESTAL/DESK MOTHERBOARD[1]
DISK CONTROLLER(optional)[3]
PROCESSOR[3]
3PPI(optional)[2]
TABLET CONTROLLER(optional)[2]
RAM/ROM
RAM CONTROLLER (optional)[2]
RAM CONTROLLER (optional)[2]
RAM CONTROLLER (optional)[2]
RAM CONTROLLER (optional)[2]
VIDEO CONTROLLER
EXTERNAL VIDEO(optional)
DUAL RASTER MEMORY
SINGLE RASTER MEMORY (standard) or DUAL RASTER MEMORY (optional)
VECTOR GENERATOR
<RESERVED>
COLOR MAP
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
J21 J22 J23 J24 J25 J26 J27 J28 J29 J30 J31 J32 J33 J34 J35 J36
80 PIN BUS
PROCESSOR BUS
J41 J42 J43 J44 J45 J46 J47
44 PIN BUS
RASTER BUS
1. This is the factory configuration for a fully optioned 4113.
2. If this option is NOT installed, it is possible to install any other processor bus board option in this position.
3. The Processor and Disk Controller boards must be installed in the order shown. They may be installed in any of the slots on the Processor Bus, but the Disk Controller Board must always precede the Processor board. If the Disk Controller board is not installed, any other option may be installed in its position.
12617-58

Figure 2-2. Circuit Board Installation in the Motherboard.

8. Inspect for the proper fuse for the specified line voltage and that the voltage range indicator is properly set for the line voltage that the terminal is being run from.

9. Check the strap settings. Refer to Appendix C for the proper setting of the straps on the circuit boards. Verify these settings are correct.

WARNING

Hazardous voltages are present in the terminal circuitry when the terminal is on. Always use proper service techniques to avoid being injured. Only qualified service technicians should perform the following adjustment procedure.

Pedestal/Desk Adjustment Procedure

Low Voltage Power Supply

1. Disconnect the ac power cord and remove the pedestal/desk front panel (it should already be removed from the inspection procedure).

2. On the pedestal, remove the right side panel. Pull the panel out from the bottom. Use a flat-bladed screwdriver to pry the panel a short distance from the frame. This panel is not screwed on and loosens suddenly when pulled far enough away from the frame.

   On the desk, the top cover must first be removed (this is held on by press-fit fasteners and can be removed by gently pulling). Once the desk top cover is removed, there is a metal plate that must be removed (this plate is held on by screws). Once this is done, the Low Voltage Power Supply on the desk may be accessed.

3. Insert the 41XX Logic Extender board into any open slot in the card cage.

4. Connect the ac power cord again and turn on the terminal.

NOTE

The locations of the following test points are printed on the 41XX Logic Extender board, along with the signals and voltages at those test points.

5. Connect the positive lead of the DVM to TP 75 of the 41XX Logic Extender board. This is the +5 V TP. Use TP 77 as a ground.

6. Adjust R685 on the Low Voltage Power Supply for a value of +5.105 V to +5.115 V. R685 is adjusted through a hole in the chassis on the upper right side. Use a penlight to help locate R685.

7. Move the DVM lead to TP 79 of the 41XX Logic Extender board--the +12 V TP. Make sure that the voltage is between +11.88 V and +12.12 V.

8. Move the positive lead of the DVM to TP 77 and the negative lead to TP 5--the -5.2 V TP. Check for a value between -5.05 V and -5.35 V.

9. Leave the positive lead of the DVM at TP 77, and move the negative lead to TP 1. Check for a value between -11.88 V and -12.12 V.

NOTE

The pedestal/desk power supply also has a +24 V regulated supply. This voltage is not used in the standard terminal. If options 42 or 43 are installed, this voltage can be checked. Consult the Option 42/43 Service Manual for this voltage check.

10. Remove the DVM leads.

NOTE

In the following peak-to-peak voltage (ripple voltage) checks, the signal may appear quite noisy and distorted, but should remain within the specified tolerances.

11. Set the oscilloscope as follows.

    Triggering

    - o Mode: AUTO
    - o Coupling: AC
    - o Source: CH 1
    - o Slope: "+"
    - o Level: set near zero

    Channel 1

    - o Volts/division: 50 mV/div
    - o Coupling: AC

    Set Time/division to 10 us/div.

12. Check ripple voltage with the oscilloscope at the voltage test points for the following values.

Test point	Voltage	Ripple value
75	+5.11 V	less than 100 mV.
79	+12.00 V	less than 100 mV.
5	-5.2 V	less than 100 mV.
1	-12.00 V	less than 100 mV.

13. Turn off the terminal and replace the right side cover (on the pedestal), but do not replace the front cover or remove the 41XX Logic Extender board. On the desk, do not replace any covers.

INIT and PFAIL

1. Set the following oscilloscope adjustments:

   - o Triggering mode: CH 1
   - o Channel 1 Volts/division: 2V/div
   - o Channel 1 coupling: DC
   - o Vertical Mode: CH 2
   - o Channel 2 Volts/division: 2V/div
   - o Channel 2 coupling: DC
   - o Channel 2 signal: INVERT
   - o Time/division: 10ms/div

2. Attach the channel 1 oscilloscope probe to TP 75 (+5.0 V) on the 41XX Logic Extender board.

3. Attach the channel 2 oscilloscope probe to TP 9 (INIT) on the 41XX Logic Extender board.

4. Turn on the terminal while watching for the INIT waveform on the oscilloscope. See Figure 2-3.

5. Verify that the observed pulse is at least 40 ms long.

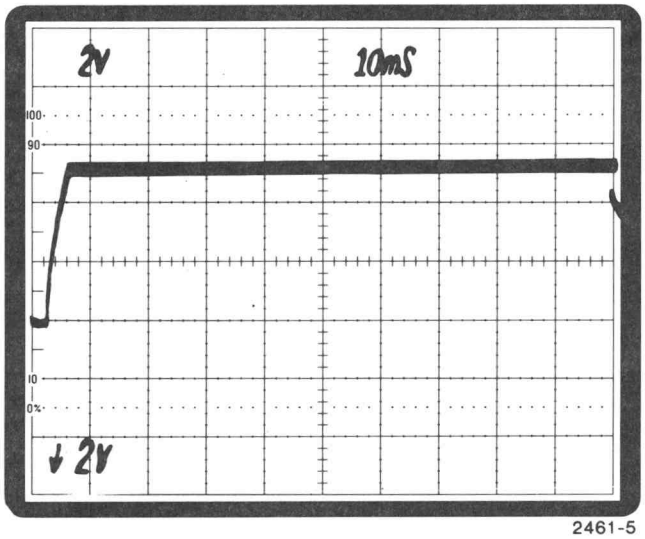


Figure 2-3. INIT Waveform.

6. Set the following oscilloscope adjustments.

   - o Trigger source: CH 2
   - o Time/division: 0.2 ms/div

7. Turn off the terminal while watching the oscilloscope for a PDWN-INIT waveform. See Figure 2-4. Do not disconnect the oscilloscope probes.

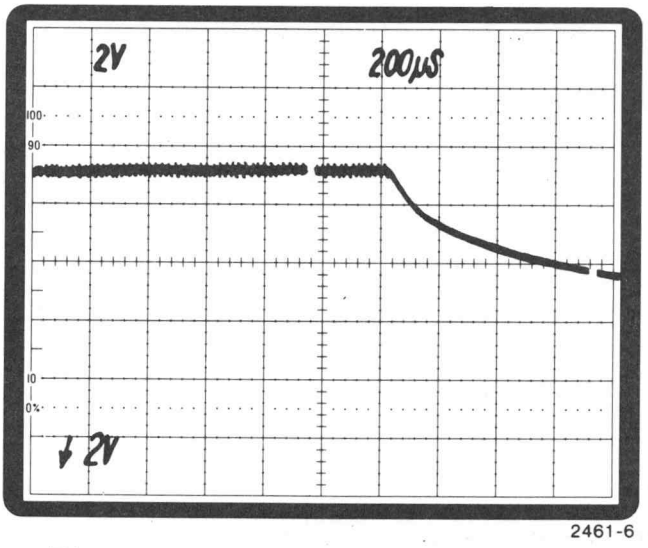


Figure 2-4. PDWN-INIT Waveform.

8. Set the following oscilloscope adjustments.

   Trigger

   - o Source: channel 1
   - o Slope: "_"
   - o Level: "Just triggers when the terminal is on."

   Set the time/division to 1 ms/div.

9. Move the channel 1 probe to TP 7 (PFAIL-0) on the 41XX Logic Extender board.

10. Turn on the terminal and allow it to stabilize. The level adjustment may have to be adjusted so that the oscilloscope is triggered properly.

11. Turn the terminal off while watching the oscilloscope for a PFAIL waveform. See Figure 2-5. Verify that the pulse generated is a minimum of 2 ms.

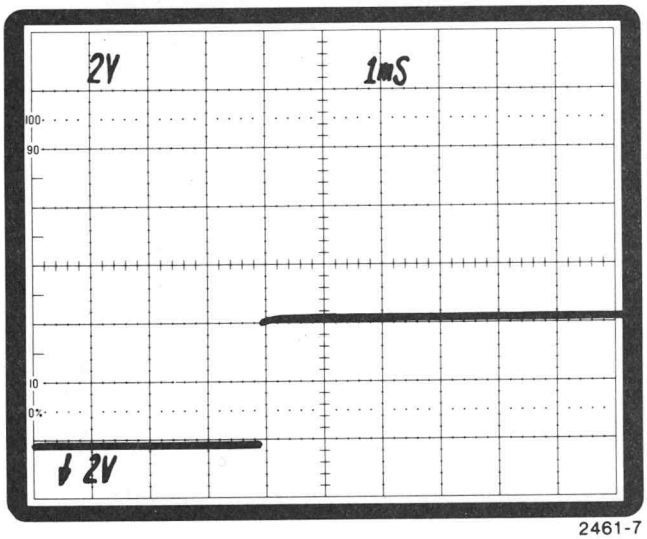


Figure 2-5. PFAIL Waveform.

13. Remove the oscilloscope probe.

14. Remove the 41XX Logic Extender board.

15. Replace all covers on the Pedestal/Desk. This concludes the adjustment procedure for the Pedestal/Desk. The Display Module adjustment procedure is now ready to be performed. For this procedure, consult the 4113 Display Module Service Manual.

Section 3
REPLACEABLE ELECTRICAL PARTS

PARTS ORDERING INFORMATION

Replacement parts are available from or through your local Tektronix, Inc. Field Office or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available, and to give you the benefit of the latest circuit improvements developed in our engineering department. It is therefore important, when ordering parts, to include the following information in your order: Part number, instrument type or number, serial number, and modification number if applicable.

If a part you have ordered has been replaced with a new or improved part, your local Tektronix, Inc. Field Office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

LIST OF ASSEMBLIES

A list of assemblies can be found at the beginning of the Electrical Parts List. The assemblies are listed in numerical order. When the complete component number of a part is known, this list will identify the assembly in which the part is located.

CROSS INDEX-MFR. CODE NUMBER TO MANUFACTURER

The Mfr. Code Number to Manufacturer index for the Electrical Parts List is located immediately after this page. The Cross Index provides codes, names and addresses of manufacturers of components listed in the Electrical Parts List.

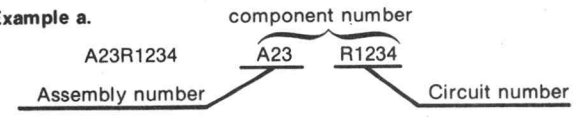
ABBREVIATIONS

Abbreviations conform to American National Standard Y1.1.

COMPONENT NUMBER (column one of the Electrical Parts List)

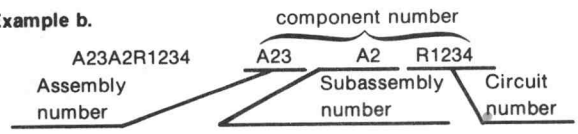
A numbering method has been used to identify assemblies, subassemblies and parts. Examples of this numbering method and typical expansions are illustrated by the following:

Example a.



Read: Resistor 1234 of Assembly 23

Example b.



Read: Resistor 1234 of Subassembly 2 of Assembly 23

Only the circuit number will appear on the diagrams and circuit board illustrations. Each diagram and circuit board illustration is clearly marked with the assembly number. Assembly numbers are also marked on the mechanical exploded views located in the Mechanical Parts List. The component number is obtained by adding the assembly number prefix to the circuit number.

The Electrical Parts List is divided and arranged by assemblies in numerical sequence (e.g., assembly A1 with its subassemblies and parts, precedes assembly A2 with its subassemblies and parts).

Chassis-mounted parts have no assembly number prefix and are located at the end of the Electrical Parts List.

TEKTRONIX PART NO. (column two of the Electrical Parts List)

Indicates part number to be used when ordering replacement part from Tektronix.

SERIAL/MODEL NO. (columns three and four of the Electrical Parts List)

Column three (3) indicates the serial number at which the part was first used. Column four (4) indicates the serial number at which the part was removed. No serial number entered indicates part is good for all serial numbers.

NAME & DESCRIPTION (column five of the Electrical Parts List)

In the Parts List, an Item Name is separated from the description by a colon (:). Because of space limitations, an Item Name may sometimes appear as incomplete. For further Item Name identification, the U.S. Federal Cataloging Handbook H6-1 can be utilized where possible.

MFR. CODE (column six of the Electrical Parts List)

Indicates the code number of the actual manufacturer of the part. (Code to name and address cross reference can be found immediately after this page.)

MFR. PART NUMBER (column seven of the Electrical Parts List)

Indicates actual manufacturers part number.

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
000FG	RIFA WORLD PRODUCTS INC.	7625 BUSH LAKE RD P.O. BOX 35263	MINNEAPOLIS, MN 55435
0000L	MATSUSHITA ELECTRIC	200 PARK AVENUE, 54TH FLOOR	NEW YORK, NY 10017
00779	AMP, INC.	P O BOX 3608	HARRISBURG, PA 17105
00853	SANGAMO ELECTRIC CO., S. CAROLINA DIV.	P O BOX 128	PICKENS, SC 29671
01002	GENERAL ELECTRIC COMPANY, INDUSTRIAL AND POWER CAPACITOR PRODUCTS DEPARTMENT	JOHN STREET	HUDSON FALLS, NY 12839
01121	ALLEN-BRADLEY COMPANY	1201 2ND STREET SOUTH	MILWAUKEE, WI 53204
01281	TRW ELECTRONIC COMPONENTS, SEMICONDUCTOR OPERATIONS	14520 AVIATION BLVD.	LAWNDALE, CA 90260
01295	TEXAS INSTRUMENTS, INC., SEMICONDUCTOR GROUP	P O BOX 5012, 13500 N CENTRAL EXPRESSWAY	DALLAS, TX 75222
01807	PETERSEN RADIO COMPANY, INC.	2800 WEST BROADWAY	COUNCIL BLUFFS, IN 51501
02735	RCA CORPORATION, SOLID STATE DIVISION	ROUTE 202	SOMERVILLE, NY 08876
03508	GENERAL ELECTRIC COMPANY, SEMI-CONDUCTOR PRODUCTS DEPARTMENT	ELECTRONICS PARK	SYRACUSE, NY 13201
04222	AVX CERAMICS, DIVISION OF AVX CORP.	P O BOX 867, 19TH AVE. SOUTH	MYRTLE BEACH, SC 29577
04713	MOTOROLA, INC., SEMICONDUCTOR PROD. DIV.	5005 E MCDOWELL RD,PO BOX 20923	PHOENIX, AZ 85036
05574	VIKING INDUSTRIES, INC.	21001 NORDHOFF STREET	CHATSWORTH, CA 91311
07263	FAIRCHILD SEMICONDUCTOR, A DIV. OF FAIRCHILD CAMERA AND INSTRUMENT CORP.	464 ELLIS STREET	MOUNTAIN VIEW, CA 94042
09353	C AND K COMPONENTS, INC.	103 MORSE STREET	WATERTOWN, MA 02172
11236	CTS OF BERNE, INC.	406 PARR RD.	BERNE, IN 46711
12697	CLAROSTAT MFG. CO., INC.	LOWER WASHINGTON STREET	DOVER, NH 03820
12969	UNITRODE CORPORATION	580 PLEASANT STREET	WATERTOWN, MA 02172
13050	POTTER CO.	HWY 51 N	WESSON, MS 39191
13571	ELECTRONIC RESEARCH CO.	P O BOX 913	SHAWNEE MISSION, KS 66201
14193	CAL-R, INC.	1601 OLYMPIC BLVD.	SANTA MONICA, CA 90404
14433	ITT SEMICONDUCTORS	3301 ELECTRONICS WAY P O BOX 3049	WEST PALM BEACH, FL 33402
14552	MICRO SEMICONDUCTOR CORP.	2830 E FAIRVIEW ST.	SANTA ANA, CA 92704
14752	ELECTRO CUBE INC.	1710 S. DEL MAR AVE.	SAN GABRIEL, CA 91776
14952	OPTICAL ENGINEERING INC.	2495 BLUE BELL DR. P.O. BOX 696	SANTA ROSA, CA 95402
15238	ITT SEMICONDUCTORS, A DIVISION OF INTER NATIONAL TELEPHONE AND TELEGRAPH CORP.	P.O. BOX 168, 500 BROADWAY	LAWRENCE, MA 01841
15454	RODAN INDUSTRIES, INC.	2905 BLUE STAR ST.	ANAHEIM, CA 92806
18324	SIGNETICS CORP.	811 E. ARQUES	SUNNYVALE, CA 94086
22526	BERG ELECTRONICS, INC.	YOUK EXPRESSWAY	NEW CUMBERLAND, PA 17070
23223	CTS MICROELECTRONICS, INC.	1201 CUMBERLAND AVENUE P O BOX 1278	WEST LAFAYETTE, IN 47902
24546	CORNING GLASS WORKS, ELECTRONIC COMPONENTS DIVISION	550 HIGH STREET	BRADFORD, PA 16701
25403	AMPEREX ELECTRONIC CORP., SEMICONDUCTOR AND MICROCIRCUITS DIV.	PROVIDENCE PIKE	SLATERSVILLE, RI 02876
27014	NATIONAL SEMICONDUCTOR CORP.	2900 SEMICONDUCTOR DR.	SANTA CLARA, CA 95051
27264	MOLEX PRODUCTS CO.	5224 KATRINE AVE.	DOWNERS GROVE, IL 60515
31019	SOLID STATE SCIENTIFIC INC.	COMMERCE DR.	MONTGOMERYVILLE, PA 18936
31918	IEE/SCHADOW INC.	8081 WALLACE ROAD	EDEN PRAIRIE, MN 55343
32159	WEST-CAP ARIZONA	2201 E. ELVIRA ROAD	TUCSON, AZ 85706
32997	BOURNS, INC., TRIMPOT PRODUCTS DIV.	1200 COLUMBIA AVE.	RIVERSIDE, CA 92507
33096	COLORADO CRYSTAL CORPORATION	2303 W 8TH STREET	LOVELAND, CO 80537
34333	SILICON GENERAL, INC.	7382 BOLSA AVE.	WESTMINSTER, CA 92683
34335	ADVANCED MICRO DEVICES	901 THOMPSON PL.	SUNNYVALE, CA 94086
34649	INTEL CORP.	3065 BOWERS AVE.	SANTA CLARA, CA 95051
50558	ELECTRONIC CONCEPTS, INC.	526 INDUSTRIAL WAY WEST	EATONTOWN, NJ 07724
52833	KEYTRONIC CORP., OCR DIV.	SPOKANE INDUSTRIAL PK., P. O. BOX 14687	SPOKANE, WA 99214
53944	ELT INC., GLOW LITE DIVISION	BOX 698	PAULS VALLEY, OK 73075
54473	MATSUSHITA ELECTRIC, CORP. OF AMERICA	1 PANASONIC WAY	SECAUCUS, NJ 07094
55210	GETTIG ENG. AND MFG. COMPANY	PO BOX 85, OFF ROUTE 45	SPRING MILLS, PA 16875
55680	NICHICON/AMERICA/CORP.	6435 N PROESEL AVENUE	CHICAGO, IL 60645
55857	GOULD INC. PORTABLE BATTERY DIV.	2777 EAGANDALE BLVD	EAGAN, MN 55121
56289	SPRAGUE ELECTRIC CO.	87 MARSHALL ST.	NORTH ADAMS, MA 01247
56880	MAGNETICS INC.	3218 NOBLE ST.	BALTIMORE, MD 21224
71400	BUSSMAN MFG., DIVISION OF MCGRAW-EDISON CO.	2536 W. UNIVERSITY ST.	ST. LOUIS, MO 63107

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
72982	ERIE TECHNOLOGICAL PRODUCTS, INC.	644 W. 12TH ST.	ERIE, PA 16512
74276	SIGNALITE DIV., GENERAL INSTRUMENT CORP.	1933 HECK AVE.	NEPTUNE, NJ 07753
75042	TRW ELECTRONIC COMPONENTS, IRC FIXED RESISTORS, PHILADELPHIA DIVISION	401 N. BROAD ST.	PHILADELPHIA, PA 19108
75915	LITTELFUSE, INC.	800 E. NORTHWEST HWY	DES PLAINES, IL 60016
80009	TEKTRONIX, INC.	P O BOX 500	BEAVERTON, OR 97077
82389	SWITCHCRAFT, INC.	5555 N. ELSTON AVE.	CHICAGO, IL 60630
82877	ROTRON, INC.	7-9 HASBROUCK LANE	WOODSTOCK, NY 12498
90201	MALLORY CAPACITOR CO., DIV. OF P. R. MALLORY AND CO., INC.	3029 E. WASHINGTON STREET P. O. BOX 372	INDIANAPOLIS, IN 46206
91418	RADIO MATERIALS COMPANY, DIV. OF P.R. MALLORY AND COMPANY, INC.	4242 W BRYN MAWR	CHICAGO, IL 60646
91637	DALE ELECTRONICS, INC.	P. O. BOX 609	COLUMBUS, NE 68601

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A1	670-7566-00			CKT BOARD ASSY:MOTHER	80009	670-7566-00
A2	672-1047-00	B010100	B010139	CKT BOARD ASSY:PROCESSOR	80009	672-1047-00
A2	672-1047-01	B010140		CKT BOARD ASSY:PROCESSOR	80009	672-1047-01
A2A1	670-6496-XX			CKT BOARD ASSY:(NOT AVAILABLE,SEE A2)		
A3	119-1400-00			KEYBOARD,CMPTR:	80009	119-1400-00
	----- -----			(STD,OPTION 4A ONLY)		
A3	119-1401-00			KEYBOARD,CMPTR:APL	80009	119-1401-00
	----- -----			(OPTION 4E ONLY)		
A3	119-1402-00			KEYBOARD,CMPTR:SWEDISH	80009	119-1402-00
	----- -----			(OPTION 4C,4F ONLY)		
A4	672-1045-00			CKT BOARD ASSY:RAM ROM	80009	672-1045-00
A4A1	670-7565-XX			CKT BOARD ASSY:(NOT AVAILABLE,SEE A4)		
A5	670-6670-00			CKT BOARD ASSY:RAM ARRAY	80009	670-6670-00
A6	670-6669-02			CKT BOARD ASSY:RAM CONTROLLER	80009	670-6669-02
	----- -----			(OPTION 24-29 ONLY)		
A7	672-1003-00			CKT BOARD ASSY:VIDEO CONTROLLER	80009	672-1003-00
A7	672-1004-02			CKT BOARD ASSY:VIDEO CONTROLLER	80009	672-1004-02
	----- -----			(OPTION A1,A2,A3,A5 ONLY)		
A7A1	670-6475-XX			CKT BOARD ASSY:(NOT AVAILABLE,SEE A7)		
A8	670-6474-02			CKT BOARD ASSY:VECTOR GENERATOR	80009	670-6474-02
A9	670-7568-00			CKT BOARD ASSY:SINGLE RASTER MEMORY	80009	670-7568-00
A10	670-6476-01			CKT BOARD ASSY:DUAL RASTER MEMORY PLANE	80009	670-6476-01
A11	670-7567-00			CKT BOARD ASSY:COLOR MAP	80009	670-7567-00
A12	670-7587-00			CKT BOARD ASSY:DISPLAY INTERCONNECT	80009	670-7587-00
A13	620-0294-01			POWER SUPPLY:	80009	620-0294-01
A13A1	670-6503-03			CKT BOARD ASSY:INVERTER	80009	670-6503-03
A13A2	670-6502-00			CKT BOARD ASSY:REGULATOR	80009	670-6502-00
A14	670-5291-XX			CKT BOARD ASSY:EXTENDER		
	----- -----			(NOT AVAILABLE, USE 067-1005-00)		
A1	670-7566-00			CKT BOARD ASSY:MOTHER	80009	670-7566-00
A1C101	290-0804-00			CAP.,FXD,ELCTLT:10UF,+50-10%,25V	55680	25ULA10V-T
A1C201	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A1C301	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A1C501	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A1C602	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A1C890	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A1CR100	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A1CR201	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A1F122	159-0194-00			FUSE,WIRE LEAD:5A,125V,0.125SEC	75915	256-005
A1F154	159-0194-00			FUSE,WIRE LEAD:5A,125V,0.125SEC	75915	256-005
A1F522	159-0194-00			FUSE,WIRE LEAD:5A,125V,0.125SEC	75915	256-005
A1F622	159-0194-00			FUSE,WIRE LEAD:5A,125V,0.125SEC	75915	256-005
A1F632	159-0194-00			FUSE,WIRE LEAD:5A,125V,0.125SEC	75915	256-005
A1F633	159-0194-00			FUSE,WIRE LEAD:5A,125V,0.125SEC	75915	256-005
A1F643	159-0194-00			FUSE,WIRE LEAD:5A,125V,0.125SEC	75915	256-005
A1F644	159-0194-00			FUSE,WIRE LEAD:5A,125V,0.125SEC	75915	256-005
A1F654	159-0194-00			FUSE,WIRE LEAD:5A,125V,0.125SEC	75915	256-005
A1F655	159-0194-00			FUSE,WIRE LEAD:5A,125V,0.125SEC	75915	256-005
A1F665	159-0194-00			FUSE,WIRE LEAD:5A,125V,0.125SEC	75915	256-005
A1J21	131-2059-01			CONN,RCPT,ELEC:CKT BD,40/80 FEM W/O EARS	00779	3-530671-0
A1J22	131-2059-01			CONN,RCPT,ELEC:CKT BD,40/80 FEM W/O EARS	00779	3-530671-0
A1J23	131-2059-01			CONN,RCPT,ELEC:CKT BD,40/80 FEM W/O EARS	00779	3-530671-0
A1J24	131-2059-01			CONN,RCPT,ELEC:CKT BD,40/80 FEM W/O EARS	00779	3-530671-0
A1J25	131-2059-01			CONN,RCPT,ELEC:CKT BD,40/80 FEM W/O EARS	00779	3-530671-0
A1J26	131-2059-01			CONN,RCPT,ELEC:CKT BD,40/80 FEM W/O EARS	00779	3-530671-0

A1 MOTHER (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A1J27	131-2059-01			CONN,RCPT,ELEC:CKT BD,40/80 FEM W/O EARS	00779	3-530671-0
A1J28	131-2059-01			CONN,RCPT,ELEC:CKT BD,40/80 FEM W/O EARS	00779	3-530671-0
A1J29	131-2059-01			CONN,RCPT,ELEC:CKT BD,40/80 FEM W/O EARS	00779	3-530671-0
A1J30	131-2059-01			CONN,RCPT,ELEC:CKT BD,40/80 FEM W/O EARS	00779	3-530671-0
A1J31	131-2059-01			CONN,RCPT,ELEC:CKT BD,40/80 FEM W/O EARS	00779	3-530671-0
A1J32	131-2059-01			CONN,RCPT,ELEC:CKT BD,40/80 FEM W/O EARS	00779	3-530671-0
A1J33	131-2059-01			CONN,RCPT,ELEC:CKT BD,40/80 FEM W/O EARS	00779	3-530671-0
A1J34	131-2059-01			CONN,RCPT,ELEC:CKT BD,40/80 FEM W/O EARS	00779	3-530671-0
A1J35	131-2059-01			CONN,RCPT,ELEC:CKT BD,40/80 FEM W/O EARS	00779	3-530671-0
A1J36	131-2059-01			CONN,RCPT,ELEC:CKT BD,40/80 FEM W/O EARS	00779	3-530671-0
A1J37	131-2621-00			CONN,RCPT,ELEC:HEADER,1 X 5,0.25 CTR	00779	640900-1
A1J38	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 15)		
A1J39	131-2621-00			CONN,RCPT,ELEC:HEADER,1 X 5,0.25 CTR	00779	640900-1
A1J40	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 4)		
A1J41	131-2282-01			CONN,RCPT,ELEC:EDGE CARD,22/44 CONT,0.125	00779	2-530671-5
A1J42	131-2282-01			CONN,RCPT,ELEC:EDGE CARD,22/44 CONT,0.125	00779	2-530671-5
A1J43	131-2282-01			CONN,RCPT,ELEC:EDGE CARD,22/44 CONT,0.125	00779	2-530671-5
A1J44	131-2282-01			CONN,RCPT,ELEC:EDGE CARD,22/44 CONT,0.125	00779	2-530671-5
A1J45	131-2282-01			CONN,RCPT,ELEC:EDGE CARD,22/44 CONT,0.125	00779	2-530671-5
A1J46	131-2282-01			CONN,RCPT,ELEC:EDGE CARD,22/44 CONT,0.125	00779	2-530671-5
A1J47	131-2282-01			CONN,RCPT,ELEC:EDGE CARD,22/44 CONT,0.125	00779	2-530671-5
A1R100	315-0331-00			RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
A1R101	315-0621-00			RES.,FXD,CMPSN:620 OHM,5%,0.25W	01121	CB6215
A1R102	307-0596-00			RES NTWK,FXD FI:7,2.2K OHM,2%,1.0W	91637	MSP08A01222G
A1R103	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A1R201	307-0596-00			RES NTWK,FXD FI:7,2.2K OHM,2%,1.0W	91637	MSP08A01222G
A1R202	307-0596-00			RES NTWK,FXD FI:7,2.2K OHM,2%,1.0W	91637	MSP08A01222G
A1R301	307-0675-00			RES NTWK,FXD FI:9,1K OHM,2%,1.25W	01121	210A102
A1R302	307-0675-00			RES NTWK,FXD FI:9,1K OHM,2%,1.25W	01121	210A102
A1R303	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
A1R304	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
A1R401	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A1R402	315-0331-00			RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
A1R403	315-0181-00			RES.,FXD,CMPSN:180 OHM,5%,0.25W	01121	CB1815
A1R465	315-0331-00			RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
A1R466	315-0181-00			RES.,FXD,CMPSN:180 OHM,5%,0.25W	01121	CB1815
A1R501	307-0596-00			RES NTWK,FXD FI:7,2.2K OHM,2%,1.0W	91637	MSP08A01222G
A1R502	307-0596-00			RES NTWK,FXD FI:7,2.2K OHM,2%,1.0W	91637	MSP08A01222G
A1R601	315-0222-00			RES.,FXD,CMPSN:2.2K OHM,5%,0.25W	01121	CB2225
A1R602	315-0222-00			RES.,FXD,CMPSN:2.2K OHM,5%,0.25W	01121	CB2225
A1R703	307-0675-00			RES NTWK,FXD FI:9,1K OHM,2%,1.25W	01121	210A102
A1R890	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A1U703	156-1252-00			MICROCIRCUIT,DI:8/3 LINE PRIORITY ENCODER	80009	156-1252-00
A1U704	156-0469-02			MICROCIRCUIT,DI:3/8 LINE DCDR	01295	SN74LS138NP3

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A2	672-1047-00			CKT BOARD ASSY:PROCESSOR	80009	672-1047-00
A2U231	160-1550-02			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM	80009	160-1550-02
A2U241	160-1549-02			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM	80009	160-1549-02
A2U330	160-1003-01			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM	80009	160-1003-01
A2U340	160-1002-01			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM	80009	160-1002-01
A2U430	160-1001-01			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM	80009	160-1001-01
A2U431	160-1544-00			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM	80009	160-1544-00
A2U440	160-1000-01			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM	80009	160-1000-01
A2U441	160-1543-00			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM	80009	160-1543-00
A2A1	670-6496-XX			CKT BOARD ASSY:(NOT AVAILABLE,SEE A2)		
A2A1BT10	146-0040-00			BATTERY,STORAGE:2.4V,70MAH,AAA CELL	55857	MS0702405333-002
A2A1C11	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C31	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C75	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C135	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C155	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C156	281-0797-00			CAP.,FXD,CER DI:15PF,10%,100V	72982	8035D9AADC0G150K
A2A1C170	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C202	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C216	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C231	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C270	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C355	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C360	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C365	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C401	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C455	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C501	283-0422-00			CAP.,FXD,CER DI:0.047UF,+80-20%,50V	04222	DG015E473Z
A2A1C502	283-0422-00			CAP.,FXD,CER DI:0.047UF,+80-20%,50V	04222	DG015E473Z
A2A1C503	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C504	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C505	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C511	283-0422-00			CAP.,FXD,CER DI:0.047UF,+80-20%,50V	04222	DG015E473Z
A2A1C512	283-0422-00			CAP.,FXD,CER DI:0.047UF,+80-20%,50V	04222	DG015E473Z
A2A1C513	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C514	283-0422-00			CAP.,FXD,CER DI:0.047UF,+80-20%,50V	04222	DG015E473Z
A2A1C525	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C526	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C536	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C541	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C551	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A2A1C555	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C560	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C565	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C570	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C575	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1C576	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A2A1CR9	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A2A1CR10	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A2A1CR11	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A2A1CR525	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A2A1CR526	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A2A1J103	131-1789-00			CONN,RCPT,ELEC:RT-ANGLE,2/100.025 SQ PINS	22526	65268-008
A2A1J125	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357

A2A1 PROCESSOR (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A2A1J150	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
A2A1J226	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
A2A1J326	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
A2A1J426	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
A2A1J427	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
A2A1J522	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
A2A1R9	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
A2A1R11	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
A2A1R12	315-0751-00			RES.,FXD,CMPSN:750 OHM,5%,0.25W	01121	CB7515
A2A1R13	315-0751-00			RES.,FXD,CMPSN:750 OHM,5%,0.25W	01121	CB7515
A2A1R31	307-0502-00			RES,NTWK,THK FI:1.8 OHM,20%,(9) RES	91637	MSP10A01-182M
A2A1R55	307-0650-00			RES NTWK,FXD,FI:9,2.7K OHM,5%,0.150W	32997	4310R-101-272
A2A1R175	315-0272-00			RES.,FXD,CMPSN:2.7K OHM,5%,0.25W	01121	CB2725
A2A1R216	307-0637-00			RES NTWK,FXD,FI:5,2K OHM,2%,0.125W	01121	206A202
A2A1R250	307-0650-00			RES NTWK,FXD,FI:9,2.7K OHM,5%,0.150W	32997	4310R-101-272
A2A1R350	307-0650-00			RES NTWK,FXD,FI:9,2.7K OHM,5%,0.150W	32997	4310R-101-272
A2A1R440	307-0446-00			RES,NTWK,FXD FI:10K OHM,20%,(9) RES	91637	MSP10A01-103M
A2A1R525	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A2A1R526	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A2A1R550	307-0446-00			RES,NTWK,FXD FI:10K OHM,20%,(9) RES	91637	MSP10A01-103M
A2A1U21	160-0985-01			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM (OPTION 1 ONLY)	80009	160-0985-01
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A2A1U25	156-0956-02			MICROCIRCUIT,DI:OCTAL BFR W/3STATE OUT	01295	SN74LS244NP3
A2A1U35	160-0843-00			MICROCIRCUIT,DI:MICROCOMPUTER,PRGM & SCRN	80009	160-0843-00
A2A1U45	156-1416-00			MICROCIRCUIT,DI:16 BIT UP,SCREENED	34649	D8086
A2A1U65	156-0385-02			MICROCIRCUIT,DI:HEX INVERTER	01295	SN74LS04
A2A1U70	156-0473-02			MICROCIRCUIT,DI:DUAL 5-INP NAND GATE,SCRN	27014	DM8092N/A+
A2A1U75	156-0479-02			MICROCIRCUIT,DI:QUAD 2-INP ORGATE	01295	SN74LS32NP3
A2A1U101	156-0382-02			MICROCIRCUIT,DI:QUAD 2-INP NAND GATE	01295	SN74LS00
A2A1U115	156-0041-05			MICROCIRCUIT,DI:DUAL D-TYPE FF,BURN-IN	01295	SN7474
A2A1U121	160-0984-01			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM (OPTION 1 ONLY)	80009	160-0984-01
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A2A1U125	156-0385-02			MICROCIRCUIT,DI:HEX INVERTER	01295	SN74LS04
A2A1U130	156-0469-02			MICROCIRCUIT,DI:3/8 LINE DCDR	01295	SN74LS138NP3
A2A1U135	156-0140-02			MICROCIRCUIT,DI:HEX BUFFERS W/OC HV OUT	27014	DM8017NA+/JA+
A2A1U140	156-0985-01			MICROCIRCUIT,DI:DUAL 5 INPUT NOR GATE,SCRN	04713	SN74LS260
A2A1U145	156-0478-02			MICROCIRCUIT,DI:DUAL 4 INP & GATE,BURN-IN	01295	SN74LS21NP3
A2A1U150	156-1065-01			MICROCIRCUIT,DI:OCTAL D TYPE TRANS LATCHES	34335	AM74LS373
A2A1U155	156-1428-01	B010100	B010139	MICROCIRCUIT,DI:CLOCK GENERATOR & DRVR	34649	D8284
A2A1U155	156-1428-02	B010140		MICROCIRCUIT,DI:CLOCK GENERATOR & DRIVER	34649	D8284A
A2A1U165	156-0694-02			MICROCIRCUIT,DI:DCDR/3 LINE TO 8 LINE,SCRN	07263	74S138DCQR
A2A1U170	156-0481-02			MICROCIRCUIT,DI:TRIPLE 3 INP & GATE	27014	DM74LS11NA+
A2A1U175	156-1059-01			MICROCIRCUIT,DI:DUAL J-K EDGE TRIGGERED	01295	SN74LS109A
A2A1U201	156-0478-02			MICROCIRCUIT,DI:DUAL 4 INP & GATE,BURN-IN	01295	SN74LS21NP3
A2A1U202	156-0382-02			MICROCIRCUIT,DI:QUAD 2-INP NAND GATE	01295	SN74LS00
A2A1U215	156-0383-02			MICROCIRCUIT,DI:QUAD 2-INP NOR GATE	01295	SN74LS02
A2A1U216	156-0385-02			MICROCIRCUIT,DI:HEX INVERTER	01295	SN74LS04
A2A1U225	156-0383-02			MICROCIRCUIT,DI:QUAD 2-INP NOR GATE	01295	SN74LS02
A2A1U226	156-0865-02			MICROCIRCUIT,DI:OCTAL D-TYPE FF W/CLEAR	01295	SN74LS273NP3
A2A1U230	156-1036-01			MICROCIRCUIT,DI:PRGM INTERVAL TIMER	34649	D8253
A2A1U235	156-1172-01			MICROCIRCUIT,DI:DUAL 4 BIT CNTR,BURN IN	01295	SN74LS393
A2A1U240	156-0392-03			MICROCIRCUIT,DI:QUAD LATCH W/CLEAR	01295	SN74S175NP3
A2A1U245	156-0385-02			MICROCIRCUIT,DI:HEX INVERTER	01295	SN74LS04
A2A1U250	156-1065-01			MICROCIRCUIT,DI:OCTAL D TYPE TRANS LATCHES	34335	AM74LS373
A2A1U255	156-1065-01			MICROCIRCUIT,DI:OCTAL D TYPE TRANS LATCHES	34335	AM74LS373
A2A1U260	156-0465-02			MICROCIRCUIT,DI:8 INP NAND GATE	01295	SN74LS30NP3
A2A1U265	156-0382-02			MICROCIRCUIT,DI:QUAD 2-INP NAND GATE	01295	SN74LS00
A2A1U270	156-0386-02			MICROCIRCUIT,DI:TRIPLE 3 INP NAND GATE	01295	SN74LS10NP3

A2A1 PROCESSOR (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A2A1U275	156-1258-01			MICROCIRCUIT,DI:DUAL J-K NEG-EDGE TRIG FF	01295	SN74LS112
A2A1U301	156-1460-00			MICROCIRCUIT,DI:ENHANCED PRGM COMM INTFC	18324	2661-2I/CP2752
A2A1U325	156-0467-02			MICROCIRCUIT,DI:QUAD 2-INP NAND BFR,SCRN	01295	SN74LS38
A2A1U350	156-1111-02			MICROCIRCUIT,DI:OCTAL BUS TRANSCEIVERS	80009	156-1111-02
A2A1U355	156-0118-03			MICROCIRCUIT,DI:1 DUAL J-K FF,BURN-IN	01295	SN74S112JP3
A2A1U360	156-0690-03			MICROCIRCUIT,DI:QUAD 2 INP NOR GATE,BURN IN	01295	SN74S02
A2A1U365	156-0722-02			MICROCIRCUIT,DI:TPL 3-INPUT POS NAND GATE	04713	SN74LS12NDS
A2A1U370	156-1204-01			MICROCIRCUIT,DI:INTERRUPT CONTROLLER,SCRN	34649	D8259A-S4242
A2A1U401	156-0391-02			MICROCIRCUIT,DI:HEX LATCH W/CLEAR	01295	SN74LS174
A2A1U415	156-0845-02			MICROCIRCUIT,DI:6 BIT COMPARATOR,BURN-IN	80009	156-0845-02
A2A1U425	156-0720-02			MICROCIRCUIT,DI:HEX DRVR,4 TO2 LINE	01295	SN74LS368
A2A1U450	156-1111-02			MICROCIRCUIT,DI:OCTAL BUS TRANSCEIVERS	80009	156-1111-02
A2A1U455	156-0419-02			MICROCIRCUIT,DI:DUAL 4 INP NAND LINE DRVR	07263	74S140
A2A1U460	156-0955-02			MICROCIRCUIT,DI:OCTAL BFR W/3 STATE OUT	04713	SN74LS241
A2A1U465	156-0385-02			MICROCIRCUIT,DI:HEX INVERTER	01295	SN74LS04
A2A1U470	156-0140-02			MICROCIRCUIT,DI:HEX BUFFERS W/OC HV OUT	27014	DM8017NA+/JA+
A2A1U475	156-0473-02			MICROCIRCUIT,DI:DUAL 5-INP NAND GATE,SCRN	27014	DM8092N/A+
A2A1U501	156-0878-01			MICROCIRCUIT,DI:QUAD LINE RCVR,SCRN	80009	156-0878-01
A2A1U515	156-0878-01			MICROCIRCUIT,DI:QUAD LINE RCVR,SCRN	80009	156-0878-01
A2A1U525	156-0879-01			MICROCIRCUIT,DI:QUAD LINE DRIVER,SCRN	80009	156-0879-01
A2A1U530	156-0479-02			MICROCIRCUIT,DI:QUAD 2-INP ORGATE	01295	SN74LS32NP3
A2A1U535	156-0887-01			MICROCIRCUIT,DI:256 X 4 SRAM,SCRN	80009	156-0887-01
A2A1U536	156-0887-01			MICROCIRCUIT,DI:256 X 4 SRAM,SCRN	80009	156-0887-01
A2A1U540	156-0887-01			MICROCIRCUIT,DI:256 X 4 SRAM,SCRN	80009	156-0887-01
A2A1U541	156-0887-01			MICROCIRCUIT,DI:256 X 4 SRAM,SCRN	80009	156-0887-01
A2A1U550	156-1111-02			MICROCIRCUIT,DI:OCTAL BUS TRANSCEIVERS	80009	156-1111-02
A2A1U555	156-1111-02			MICROCIRCUIT,DI:OCTAL BUS TRANSCEIVERS	80009	156-1111-02
A2A1U560	156-1427-01			MICROCIRCUIT,DI:BUS CONTROLLER,SCREENED	34649	D8288
A2A1U565	156-1065-01			MICROCIRCUIT,DI:OCTAL D TYPE TRANS LATCHES	34335	AM74LS373
A2A1U570	156-1065-01			MICROCIRCUIT,DI:OCTAL D TYPE TRANS LATCHES	34335	AM74LS373
A2A1U575	156-1065-01			MICROCIRCUIT,DI:OCTAL D TYPE TRANS LATCHES	34335	AM74LS373
A2A1Y155	158-0135-00			XTAL UNIT,QTZ:14.7456 MHZ,0.01%,SERIES	01807	OBD
	-----	-----		(XTAL UNIT REQUIRES FOAM ADHESIVE)		

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A3	119-1400-00			KEYBOARD,CMPTR:	80009	119-1400-00
	----- -----			(STANDARD, OPTION 4A ONLY)		
A3	119-1401-00			KEYBOARD,CMPTR:APL	80009	119-1401-00
	----- -----			(OPTION 4E ONLY)		
A3	119-1402-00			KEYBOARD,CMPTR:SWEDISH	80009	119-1402-00
	----- -----			(OPTION 4C,4F ONLY)		
A3C1	118-0964-00			CAP.,FXD,ELCTLT:10UF,15V,TANTALUM	80009	118-0964-00
A3C2	118-0963-00			CAP.,FXD,ELCTLT:2.2UF,16V,TANTALUM	80009	118-0963-00
A3C3	118-0965-00			CAP.,FXD,CER DI:0.033UF,100V	80009	118-0965-00
A3C4	118-0965-00			CAP.,FXD,CER DI:0.033UF,100V	80009	118-0965-00
A3C5	118-0965-00			CAP.,FXD,CER DI:0.033UF,100V	80009	118-0965-00
A3C6	118-0965-00			CAP.,FXD,CER DI:0.033UF,100V	80009	118-0965-00
A3C7	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
A3C8	118-0965-00			CAP.,FXD,CER DI:0.033UF,100V	80009	118-0965-00
A3C9	118-0965-00			CAP.,FXD,CER DI:0.033UF,100V	80009	118-0965-00
A3C10	118-0965-00			CAP.,FXD,CER DI:0.033UF,100V	80009	118-0965-00
A3C11	118-0965-00			CAP.,FXD,CER DI:0.033UF,100V	80009	118-0965-00
A3C12	118-0965-00			CAP.,FXD,CER DI:0.033UF,100V	80009	118-0965-00
A3C13	118-0965-00			CAP.,FXD,CER DI:0.033UF,100V	80009	118-0965-00
A3C14	118-0965-00			CAP.,FXD,CER DI:0.033UF,100V	80009	118-0965-00
A3C15	118-0965-00			CAP.,FXD,CER DI:0.033UF,100V	80009	118-0965-00
A3C16	118-0965-00			CAP.,FXD,CER DI:0.033UF,100V	80009	118-0965-00
A3C18	118-0965-00			CAP.,FXD,CER DI:0.033UF,100V	80009	118-0965-00
A3C19	281-0759-00			CAP.,FXD,CER DI:22PF,10%,100V	72982	8035D9AADC1G220K
A3C20	281-0759-00			CAP.,FXD,CER DI:22PF,10%,100V	72982	8035D9AADC1G220K
A3C21	281-0759-00			CAP.,FXD,CER DI:22PF,10%,100V	72982	8035D9AADC1G220K
A3C22	281-0759-00			CAP.,FXD,CER DI:22PF,10%,100V	72982	8035D9AADC1G220K
A3C23	281-0759-00			CAP.,FXD,CER DI:22PF,10%,100V	72982	8035D9AADC1G220K
A3C24	281-0759-00			CAP.,FXD,CER DI:22PF,10%,100V	72982	8035D9AADC1G220K
A3C25	281-0759-00			CAP.,FXD,CER DI:22PF,10%,100V	72982	8035D9AADC1G220K
A3C26	281-0759-00			CAP.,FXD,CER DI:22PF,10%,100V	72982	8035D9AADC1G220K
A3C27	283-0111-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8121-N088Z5U104M
A3DS1	118-0966-00			LT EMITTING DIO:RED,40MA MAX,1.5V	52833	21-05053-00
A3DS2	118-0966-00			LT EMITTING DIO:RED,40MA MAX,1.5V	52833	21-05053-00
A3DS3	118-0966-00			LT EMITTING DIO:RED,40MA MAX,1.5V	52833	21-05053-00
A3DS4	118-0966-00			LT EMITTING DIO:RED,40MA MAX,1.5V	52833	21-05053-00
A3DS6	118-0967-00			LT EMITTING DIO:ORANGE,630NM,35MA MAX,2.4V	52833	21-57152-00
A3DS7	118-0967-00			LT EMITTING DIO:ORANGE,630NM,35MA MAX,2.4V	52833	21-57152-00
A3DS8	118-0967-00			LT EMITTING DIO:ORANGE,630NM,35MA MAX,2.4V	52833	21-57152-00
A3DS9	118-0967-00			LT EMITTING DIO:ORANGE,630NM,35MA MAX,2.4V	52833	21-57152-00
A3DS18	118-0967-00			LT EMITTING DIO:ORANGE,630NM,35MA MAX,2.4V	52833	21-57152-00
A3DS19	118-0967-00			LT EMITTING DIO:ORANGE,630NM,35MA MAX,2.4V	52833	21-57152-00
A3DS20	118-0967-00			LT EMITTING DIO:ORANGE,630NM,35MA MAX,2.4V	52833	21-57152-00
A3Q1	151-0254-00			TRANSISTOR:SILICON,NPN	03508	X38L3118
A3Q2	151-0301-00			TRANSISTOR:SILICON,PNP	27014	2N2907A
A3Q3	151-0302-00			TRANSISTOR:SILICON,NPN	07263	S038487
A3R1	315-0224-00			RES.,FXD,CMPSN:220K OHM,5%,0.25W	01121	CB2245
A3R2	315-0563-00			RES.,FXD,CMPSN:56K OHM,5%,0.25W	01121	CB5635
A3R3	315-0222-00			RES.,FXD,CMPSN:2.2K OHM,5%,0.25W	01121	CB2225
A3R4	315-0222-00			RES.,FXD,CMPSN:2.2K OHM,5%,0.25W	01121	CB2225
A3R5	315-0183-00			RES.,FXD,CMPSN:18K OHM,5%,0.25W	01121	CB1835
A3R6	315-0223-00			RES.,FXD,CMPSN:22K OHM,5%,0.25W	01121	CB2235
A3R7	315-0200-00			RES.,FXD,CMPSN:20 OHM,5%,0.25W	01121	CB2005
A3R8	315-0820-00			RES.,FXD,CMPSN:82 OHM,5%,0.25W	01121	CB8205
A3R9	315-0682-00			RES.,FXD,CMPSN:6.8K OHM,5%,0.25W	01121	CB6825
A3R10	322-0184-00			RES.,FXD,FILM:806 OHM,1%,0.25W	75042	CEBT0-8060F
A3R11	315-0333-00			RES.,FXD,CMPSN:33K OHM,5%,0.25W	01121	CB3335

A3 KEYBOARD CMPTR (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A3R12	315-0820-00			RES.,FXD,CMPSN:82 OHM,5%,0.25W	01121	CB8205
A3R13	315-0820-00			RES.,FXD,CMPSN:82 OHM,5%,0.25W	01121	CB8205
A3R14	315-0332-00			RES.,FXD,CMPSN:3.3K OHM,5%,0.25W	01121	CB3325
A3R15	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
A3R16	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A3R17	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
A3R18	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A3R19	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
A3R20	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A3R21	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
A3R22	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A3R23	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A3R24	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A3R25	315-0332-00			RES.,FXD,CMPSN:3.3K OHM,5%,0.25W	01121	CB3325
A3R26	315-0332-00			RES.,FXD,CMPSN:3.3K OHM,5%,0.25W	01121	CB3325
A3R27	315-0332-00			RES.,FXD,CMPSN:3.3K OHM,5%,0.25W	01121	CB3325
A3R28	315-0332-00			RES.,FXD,CMPSN:3.3K OHM,5%,0.25W	01121	CB3325
A3R29	315-0820-00			RES.,FXD,CMPSN:82 OHM,5%,0.25W	01121	CB8205
A3RX1	307-0540-00			RES,NTWK,FXD,FI:(5) 1K OHM,10%,0.7W	01121	206A102
A3RX3	307-0792-00			RES NTWK,FXD,FI:7,82 OHM,2%,0.15W	11236	750-81-R82
A3U1	156-0402-00			MICROCIRCUIT,LI:TIMER	27014	LM555CN
A3U2	156-0645-02			MICROCIRCUIT,DI:HEX INV ST NANOS-NAND	01295	SN74LS14NP3
A3U3	156-0392-00			MICROCIRCUIT,DI:QUAD LATCH	34335	SN74LS175N OR J
A3U4	118-0941-00			MICROCIRCUIT,LI:KYBD DETECTOR,CAPACITIVE	52833	22-00908-003
A3U5	118-0973-00			MICROCIRCUIT,DI:TTL,X-LINE DRIVER	52833	22-00950-003
A3U6	156-0153-02			MICROCIRCUIT,DI:HEX INVERTER BUFFER	27014	DM8006
A3U7	156-0874-00			MICROCIRCUIT,DI:8 BIT ADDRESSABLE LATCHES	80009	156-0874-00
A3U8	156-0874-00			MICROCIRCUIT,DI:8 BIT ADDRESSABLE LATCHES	80009	156-0874-00
A3U9	156-0153-02			MICROCIRCUIT,DI:HEX INVERTER BUFFER	27014	DM8006
A3U10	156-0961-00			MICROCIRCUIT,DI:QUAD 2-INP NAND ST	80009	156-0961-00
A3U11	156-0480-00			MICROCIRCUIT,DI:QUAD 2-INPUT AND GATE	01295	SN74LS08(N OR J)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A4	672-1045-00			CKT BOARD ASSY:RAM ROM	80009	672-1045-00
A4U31	160-0987-01			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM	80009	160-0987-01
A4U41	160-0989-01			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM	80009	160-0989-01
A4U51	160-1534-00			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM	80009	160-1534-00
A4U61	160-1536-00			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM	80009	160-1536-00
A4U71	160-1538-00			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM	80009	160-1538-00
A4U81	160-1540-00			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM	80009	160-1540-00
A4U84	160-1542-00			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM	80009	160-1542-00
A4U131	160-0986-01			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM	80009	160-0986-01
A4U141	160-0988-01			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM	80009	160-0988-01
A4U151	160-1533-00			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM	80009	160-1533-00
A4U161	160-1535-00			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM	80009	160-1535-00
A4U171	160-1537-00			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM	80009	160-1537-00
A4U181	160-1539-00			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM	80009	160-1539-00
A4U184	160-1541-00			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM	80009	160-1541-00
A4A1	670-7565-XX			CKT BOARD ASSY:(NOT AVAILABLE,SEE A4)		
A4A1C11	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C21	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C31	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C41	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C51	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C61	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C71	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C81	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C84	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C87	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C90	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C93	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C98	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C111	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C121	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C131	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C141	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C151	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C161	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C171	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C181	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C184	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C187	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C190	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C193	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C198	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C255	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C265	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C280	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C350	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C355	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C365	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C370	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C390	281-0797-00			CAP.,FXD,CER DI:15PF,10%,100V	72982	8035D9AADC0G150K
A4A1C391	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C450	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C455	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C460	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z

A4A1 RAM ROM (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A4A1C461	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A4A1C470	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C480	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C485	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1C490	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A4A1CR485	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A4A1J111	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 5)		
A4A1J121	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 5)		
A4A1J131	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 5)		
A4A1J141	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 5)		
A4A1J151	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 5)		
A4A1J161	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 5)		
A4A1J171	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 5)		
A4A1J181	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 5)		
A4A1J184	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 5)		
A4A1J187	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 5)		
A4A1J190	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 5)		
A4A1J193	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF)		
A4A1J290	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 3)		
A4A1J360	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 3)		
A4A1J365	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 3)		
A4A1J370	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 2)		
A4A1J375	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 2)		
A4A1J470	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 2)		
A4A1L390	108-0088-00			COIL,RF:FIXED,3.35UH	80009	108-0088-00
A4A1R96	307-0445-00			RES NTWK,FXD,FI:4.7K OHM,20%,(9) RES	91637	MSP10A01-472M
A4A1R196	307-0445-00			RES NTWK,FXD,FI:4.7K OHM,20%,(9) RES	91637	MSP10A01-472M
A4A1R266	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
A4A1R271	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
A4A1R361	315-0331-00			RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
A4A1R366	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
A4A1R371	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
A4A1R385	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A4A1R386	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A4A1R387	315-0821-00			RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
A4A1R388	315-0821-00			RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
A4A1R449	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A4A1R461	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A4A1R462	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705

A4A1 RAM ROM (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A4A1R466	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
A4A1R485	315-0132-00			RES.,FXD,CMPSN:1.3K OHM,5%,0.25W	01121	CB1325
A4A1U11	160-0983-01			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM	80009	160-0983-01
	----- -----			(OPTION 4A,4C,4E,4F ONLY)		
A4A1U98	156-0956-02			MICROCIRCUIT,DI:OCTAL BFR W/3 STATE OUT	01295	SN74LS244NP3
A4A1U111	160-0982-01			MICROCIRCUIT,DI:4096 X 8 EPROM,PRGM	80009	160-0982-01
	----- -----			(OPTION 4A,4C,4E,4F ONLY)		
A4A1U198	156-0956-02			MICROCIRCUIT,DI:OCTAL BFR W/3 STATE OUT	01295	SN74LS244NP3
A4A1U250	156-0465-02			MICROCIRCUIT,DI:8 INP NAND GATE	01295	SN74LS30NP3
A4A1U255	156-0694-02			MICROCIRCUIT,DI:DCDR/3 LINE TO 8 LINE,SCRN	07263	74S138DCQR
A4A1U260	156-0694-02			MICROCIRCUIT,DI:DCDR/3 LINE TO 8 LINE,SCRN	07263	74S138DCQR
A4A1U265	156-0385-02			MICROCIRCUIT,DI:HEX INVERTER	01295	SN74LS04
A4A1U270	156-0465-02			MICROCIRCUIT,DI:8 INP NAND GATE	01295	SN74LS30NP3
A4A1U275	156-0418-01			MICROCIRCUIT,DI:8 INPUT NAND GATE,SCRN	01295	SN74S30
A4A1U280	156-1599-00			MICROCIRCUIT,DI:TTL,DYNAMIC RAM CONTROLLER		
A4A1U350	156-1065-01			MICROCIRCUIT,DI:OCTAL D TYPE TRANS LATCHES	34335	AM74LS373
A4A1U355	156-0956-02			MICROCIRCUIT,DI:OCTAL BFR W/3 STATE OUT	01295	SN74LS244NP3
A4A1U360	156-0180-04			MICROCIRCUIT,DI:QUAD 2 INP NAND GATE	01295	SN74S00NP3
A4A1U365	156-1393-01			MICROCIRCUIT,DI:QUAD 2 INPUT NAND BFR,SCRN	01295	SN74S38N3/J4
A4A1U370	156-0388-02			MICROCIRCUIT,DI:DL D FLIP-FLOP,CHK	80009	156-0388-02
A4A1U375	156-0966-01			MICROCIRCUIT,DI:DUAL 5 INP NOR GATES	80009	156-0966-01
A4A1U390	156-0180-04			MICROCIRCUIT,DI:QUAD 2 INP NAND GATE	01295	SN74S00NP3
A4A1U450	156-1065-01			MICROCIRCUIT,DI:OCTAL D TYPE TRANS LATCHES	34335	AM74LS373
A4A1U455	156-0956-02			MICROCIRCUIT,DI:OCTAL BFR W/3 STATE OUT	01295	SN74LS244NP3
A4A1U460	156-0707-03			MICROCIRCUIT,DI:QUAD 2 INP EXCL OR GATE	07263	74S86
A4A1U465	156-0739-02			MICROCIRCUIT,DI:QUAD 2 INP OR GATE,SCRN	01295	SN74S32
A4A1U470	156-0035-02			MICROCIRCUIT,DI:SGL 8 INPUT NAND GATE	27014	DM8030NA+/JA+
A4A1U475	156-0323-02			MICROCIRCUIT,DI:HEX INVERTER,BURN-IN	01295	SN74S04
A4A1U480	156-1179-01			MICROCIRCUIT,DI:OCTAL BFR,W/3 STATE OUT	01295	SN74S241 JP3
A4A1U485	156-0956-02			MICROCIRCUIT,DI:OCTAL BFR W/3 STATE OUT	01295	SN74LS244NP3
A4A1U490	156-0956-02			MICROCIRCUIT,DI:OCTAL BFR W/3 STATE OUT	01295	SN74LS244NP3
A4A1VR485	152-0195-00			SEMICOND DEVICE:ZENER,0.4W,5.1V,5%	04713	SZ11755
A4A1Y385	158-0081-00			XTAL UNIT,QTZ:22.008MHZ,+/-0.01%	33096	PB3086
	----- -----			(XTAL UNIT REQUIRES FOAM ADHESIVE)		

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A5	670-6670-00			CKT BOARD ASSY:RAM ARRAY	80009	670-6670-00
A5C11	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A5C21	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A5C31	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A5C41	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A5C151	290-0748-00			CAP.,FXD,ELCTLT:10UF,+50-10%,20V	56289	500D149
A5C211	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A5C215	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A5C221	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A5C225	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A5C231	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A5C235	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A5C241	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A5C245	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A5C351	290-0748-00			CAP.,FXD,ELCTLT:10UF,+50-10%,20V	56289	500D149
A5C411	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A5C415	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A5C421	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A5C425	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A5C431	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A5C435	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A5C441	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A5C445	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A5R15	131-0566-00			BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1
A5R25	131-0566-00			BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1
A5R45	131-0566-00			BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1
A5U111	156-0968-02			MICROCIRCUIT,DI:16384 X 1 DYNAMIC RAM	80009	156-0968-02
A5U115	156-0968-02			MICROCIRCUIT,DI:16384 X 1 DYNAMIC RAM	80009	156-0968-02
A5U121	156-0968-02			MICROCIRCUIT,DI:16384 X 1 DYNAMIC RAM	80009	156-0968-02
A5U125	156-0968-02			MICROCIRCUIT,DI:16384 X 1 DYNAMIC RAM	80009	156-0968-02
A5U131	156-0968-02			MICROCIRCUIT,DI:16384 X 1 DYNAMIC RAM	80009	156-0968-02
A5U135	156-0968-02			MICROCIRCUIT,DI:16384 X 1 DYNAMIC RAM	80009	156-0968-02
A5U141	156-0968-02			MICROCIRCUIT,DI:16384 X 1 DYNAMIC RAM	80009	156-0968-02
A5U145	156-0968-02			MICROCIRCUIT,DI:16384 X 1 DYNAMIC RAM	80009	156-0968-02
A5U311	156-0968-02			MICROCIRCUIT,DI:16384 X 1 DYNAMIC RAM	80009	156-0968-02
A5U315	156-0968-02			MICROCIRCUIT,DI:16384 X 1 DYNAMIC RAM	80009	156-0968-02
A5U321	156-0968-02			MICROCIRCUIT,DI:16384 X 1 DYNAMIC RAM	80009	156-0968-02
A5U325	156-0968-02			MICROCIRCUIT,DI:16384 X 1 DYNAMIC RAM	80009	156-0968-02
A5U331	156-0968-02			MICROCIRCUIT,DI:16384 X 1 DYNAMIC RAM	80009	156-0968-02
A5U335	156-0968-02			MICROCIRCUIT,DI:16384 X 1 DYNAMIC RAM	80009	156-0968-02
A5U341	156-0968-02			MICROCIRCUIT,DI:16384 X 1 DYNAMIC RAM	80009	156-0968-02
A5U345	156-0968-02			MICROCIRCUIT,DI:16384 X 1 DYNAMIC RAM	80009	156-0968-02

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A6	670-6669-02			CKT BOARD ASSY:RAM CONTROLLER (OPTION 24-29 ONLY)	80009	670-6669-02
	----- -----					
A6C151	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A6C256	281-0797-00			CAP.,FXD,CER DI:15PF,10%,100V	72982	8035D9AADC0G150K
A6C351	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A6C451	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A6C515	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A6C521	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A6C525	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A6C531	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A6C535	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A6C545	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A6C561	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A6C565	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A6C571	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A6C575	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A6C581	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A6C585	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A6C591	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A6C595	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A6CR596	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A6J165	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QUANTITY OF 12)	22526	47357
	----- -----					
A6L261	108-0088-00			COIL,RF:FIXED,3.35UH	80009	108-0088-00
A6R348	315-0821-00			RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
A6R349	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A6R357	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A6R358	315-0821-00			RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
A6R516	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A6R522	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A6R523	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A6R524	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A6R526	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A6R527	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A6R532	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
A6R533	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
A6R536	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
A6R537	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A6R538	131-0566-00			BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1
A6R539	131-0566-00			BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1
A6R551	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A6R552	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A6R553	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A6R598	315-0132-00			RES.,FXD,CMPSN:1.3K OHM,5%,0.25W	01121	CB1325
A6U151	156-0694-02			MICROCIRCUIT,DI:DCDR/3 LINE TO 8 LINE,SCRN	07263	74S138DCQR
A6U351	156-0180-04			MICROCIRCUIT,DI:QUAD 2 INP NAND GATE	01295	SN74S00NP3
A6U451	156-1599-00			MICROCIRCUIT,DI:TTL,DYNAMIC RAM CONTROLLER		
A6U515	156-0693-02			MICROCIRCUIT,DI:DECODER/DEMULTIPLEXER	27014	DM74S139
A6U521	156-0459-02			MICROCIRCUIT,DI:QUAD 2 INPUT & GATE,BURN	01295	SN74S08
A6U525	156-0739-02			MICROCIRCUIT,DI:QUAD 2 INP OR GATE,SCRN	01295	SN74S32
A6U531	156-1393-01			MICROCIRCUIT,DI:QUAD 2 INPUT NAND BFR,SCRN	01295	SN74S38N3/J4
A6U561	156-0739-02			MICROCIRCUIT,DI:QUAD 2 INP OR GATE,SCRN	01295	SN74S32
A6U565	156-0956-02			MICROCIRCUIT,DI:OCTAL BFR W/3 STATE OUT	01295	SN74LS244NP3
A6U571	156-1065-01			MICROCIRCUIT,DI:OCTAL D TYPE TRANS LATCHES	34335	AM74LS373
A6U575	156-0956-02			MICROCIRCUIT,DI:OCTAL BFR W/3 STATE OUT	01295	SN74LS244NP3
A6U581	156-1065-01			MICROCIRCUIT,DI:OCTAL D TYPE TRANS LATCHES	34335	AM74LS373
A6U585	156-1179-01			MICROCIRCUIT,DI:OCTAL BFR,W/3 STATE OUT	01295	SN74S241 JP3

A6 RAM CONTROLLER (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A6U591	156-0956-02			MICROCIRCUIT,DI:OCTAL BFR W/3 STATE OUT	01295	SN74LS244NP3
A6U595	156-0956-02			MICROCIRCUIT,DI:OCTAL BFR W/3 STATE OUT	01295	SN74LS244NP3
A6VR597	152-0195-00			SEMICOND DEVICE:ZENER,0.4W,5.1V,5%	04713	SZ11755
A6Y251	158-0081-00			XTAL UNIT,QTZ:22.008MHZ,+/-0.01%	33096	PB3086
	----- -----			(XTAL UNIT REQUIRES FOAM ADHESIVE)		

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A7	672-1003-00			CKT BOARD ASSY:VIDEO CONTROLLER	80009	672-1003-00
A7	672-1004-02			CKT BOARD ASSY:VIDEO CONTROLLER	80009	672-1004-02
	----- -----			(OPTION A1,A2,A3,A5 ONLY)		
A7A1	670-6475-XX			CKT BOARD ASSY:(NOT AVAILABLE,SEE A7)		
A7Y5	158-0240-00			CRYSTAL,UNIT:100.8 MHZ,0.01 SERIES	33096	PB5059
A7Y5	158-0106-00			XTAL UNIT,QTZ:100MHZ,+/-0.0025%,SERIES	13571	TEK158-0106-00
	----- -----			(OPTION A1,A3,A3,A5 ONLY)		
A7A1	670-6475-XX			CKT BOARD ASSY:(NOT AVAILABLE,SEE A7)		
A7A1C7	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C12	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C15	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C20	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C22	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C25	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C26	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C42	281-0812-00			CAP.,FXD,CER DI:1000PF,10%,100V	72982	8035D9AADX7R102K
A7A1C101	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C104	281-0811-00			CAP.,FXD,CER DI:10PF,10%,100V	72982	8035D2AADC1G100K
A7A1C114	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A7A1C117	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A7A1C152	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	56289	273C5
A7A1C154	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	56289	273C5
A7A1C156	281-0823-00			CAP.,FXD,CER DI:470PF,10%,50V	12969	CGB471KDN
A7A1C161	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C171	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C205	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C211	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C215	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C225	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C245	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C251	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C265	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C305	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C311	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C315	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C321	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C325	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C335	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C341	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C355	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C365	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C371	281-0823-00			CAP.,FXD,CER DI:470PF,10%,50V	12969	CGB471KDN
A7A1C405	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C411	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C415	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C421	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C425	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C505	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C511	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C515	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C521	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C522	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C525	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C535	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C541	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z

A7A1 VIDEO CONTROLLER (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A7A1C545	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C565	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C571	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C605	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C608	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C609	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A7A1C611	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C615	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C620	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A7A1C641	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A7A1C642	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C645	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C648	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A7A1C649	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C665	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C671	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1C681	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A7A1C682	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A7A1CR321	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A7A1CR502	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A7A1J55	131-0608-00 ----- -----			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QUANTITY OF 2)	22526	47357
A7A1J56	131-0608-00 ----- -----			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QUANTITY OF 2)	22526	47357
A7A1J201	131-0608-00 ----- -----			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QUANTITY OF 2)	22526	47357
A7A1J282	131-0608-00 ----- -----			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QUANTITY OF 10)	22526	47357
A7A1J283	131-0608-00 ----- -----			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QUANTITY OF 10)	22526	47357
A7A1J285	131-0589-00 ----- -----			TERMINAL,PIN:0.46 L X 0.025 SQ (QUANTITY OF 7)	22526	47350
A7A1J286	131-0589-00 ----- -----			TERMINAL,PIN:0.46 L X 0.025 SQ (QUANTITY OF 3)	22526	47350
A7A1J287	131-0589-00 ----- -----			TERMINAL,PIN:0.46 L X 0.025 SQ (QUANTITY OF 2)	22526	47350
A7A1J310	131-0608-00 ----- -----			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QUANTITY OF 3)	22526	47357
A7A1J361	131-0608-00 ----- -----			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QUANTITY OF 2)	22526	47357
A7A1J501	131-0608-00 ----- -----			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QUANTITY OF 2)	22526	47357
A7A1J551	131-0608-00 ----- -----			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QUANTITY OF 3)	22526	47357
A7A1J563	131-0608-00 ----- -----			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QUANTITY OF 2)	22526	47357
A7A1J650	131-0608-00 ----- -----			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QUANTITY OF 2)	22526	47357
A7A1L106	108-0182-00			COIL,RF:0.3UH	80009	108-0182-00
A7A1Q11	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A7A1Q13	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A7A1Q15	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A7A1Q17	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A7A1Q19	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A7A1Q21	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A7A1Q23	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A7A1Q26	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677

A7A1 VIDEO CONTROLLER (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A7A1Q27	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A7A1Q28	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A7A1Q29	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A7A1Q30	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A7A1Q31	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A7A1Q47	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A7A1Q621	151-0373-00			TRANSISTOR:SILICON,PNP	80009	151-0373-00
A7A1Q625	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A7A1R8	315-0200-00			RES.,FXD,CMPSN:20 OHM,5%,0.25W	01121	CB2005
A7A1R14	321-0147-00			RES.,FXD,FILM:332 OHM,1%,0.125W	91637	MFF1816G332R0F
A7A1R16	321-0222-00			RES.,FXD,FILM:2K OHM,1%,0.125W	91637	MFF1816G20000F
A7A1R18	321-0198-00			RES.,FXD,FILM:1.13K OHM,1%,0.125W	91637	MFF1816G11300F
A7A1R20	321-0227-00			RES.,FXD,FILM:2.26K OHM,1%,0.125W	91637	MFF1816G22600F
A7A1R22	321-0140-00			RES.,FXD,FILM:280 OHM,1%,0.125W	91637	MFF1816G280R0F
A7A1R24	321-0169-00			RES.,FXD,FILM:562 OHM,1%,0.125W	91637	MFF1816G562R0F
A7A1R27	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A7A1R28	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A7A1R30	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A7A1R34	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
A7A1R35	315-0750-00			RES.,FXD,CMPSN:75 OHM,5%,0.25W	01121	CB7505
A7A1R41	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
A7A1R45	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A7A1R51	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
A7A1R52	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A7A1R102	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
A7A1R103	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
A7A1R107	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
A7A1R114	323-0122-00			RES.,FXD,FILM:182 OHM,1%,0.50W	75042	CECT0-1820F
A7A1R115	321-0106-00			RES.,FXD,FILM:124 OHM,1%,0.125W	91637	MFF1816G124R0F
A7A1R116	307-0489-00			RES,NTWK,FXD,FI:100 OHM,20%,1W	32997	4308R-101-101
A7A1R117	307-0486-00			RES,NTWK,THK FI:100 OHM,20%,1.125W	91637	MSP10A01-101J
A7A1R128	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A7A1R151	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
A7A1R153	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A7A1R155	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A7A1R165	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A7A1R212	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
A7A1R226	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A7A1R271	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A7A1R301	307-0486-00			RES,NTWK,THK FI:100 OHM,20%,1.125W	91637	MSP10A01-101J
A7A1R321	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
A7A1R361	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A7A1R371	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A7A1R401	307-0487-00			RES,NTWK,FXD,FI:100 OHM,20%,0.50W	91637	CSP04E01-101J
A7A1R413	307-0486-00			RES,NTWK,THK FI:100 OHM,20%,1.125W	91637	MSP10A01-101J
A7A1R431	307-0486-00			RES,NTWK,THK FI:100 OHM,20%,1.125W	91637	MSP10A01-101J
A7A1R501	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
A7A1R519	307-0486-00			RES,NTWK,THK FI:100 OHM,20%,1.125W	91637	MSP10A01-101J
A7A1R525	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A7A1R545	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A7A1R609	307-0486-00			RES,NTWK,THK FI:100 OHM,20%,1.125W	91637	MSP10A01-101J
A7A1R619	307-0487-00			RES,NTWK,FXD,FI:100 OHM,20%,0.50W	91637	CSP04E01-101J
A7A1R629	321-0129-00			RES.,FXD,FILM:215 OHM,1%,0.125W	91637	MFF1816G215R0F
A7A1R631	308-0778-00			RES.,FXD,WW:3 OHM,5%,5W	91637	CW5-3R000J
A7A1R633	308-0778-00			RES.,FXD,WW:3 OHM,5%,5W	91637	CW5-3R000J
A7A1R665	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A7A1U111	156-0759-02			MICROCIRCUIT,DI:QUAD 2-INP OR GATE,SCRN	04713	SC22689P103

A7A1 VIDEO CONTROLLER (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A7A1U117	156-0991-00			MICROCIRCUIT,LI:VOLTAGE REGULATOR	04713	MC78L05ACP
A7A1U121	156-0458-01			MICROCIRCUIT,DI:QUAD AND GATE2 INP,SCRN	04713	SC22689P104
A7A1U125	156-0368-03			MICROCIRCUIT,DI:TTL TO ECL QUAD TRANS	80009	156-0368-03
A7A1U141	156-0331-03			MICROCIRCUIT,DI:DUAL D TYPE POSITIVE EDGE	80009	156-0331-03
A7A1U145	156-0388-03			MICROCIRCUIT,DI:DUAL D FLIP-FLOP	07263	74LS74A
A7A1U155	156-0733-02			MICROCIRCUIT,DI:DUAL MONOSTABLE MV,BURN-IN	04713	SN74LS221N/J
A7A1U161	156-0383-02			MICROCIRCUIT,DI:QUAD 2-INP NOR GATE	01295	SN74LS02
A7A1U165	156-0180-04			MICROCIRCUIT,DI:QUAD 2 INP NAND GATE	01295	SN74S00NP3
A7A1U171	156-0985-01			MICROCIRCUIT,DI:DUAL 5 INPUT NOR GATE,SCRN	04713	SN74LS260
A7A1U205	156-0182-02			MICROCIRCUIT,DI:TRIPLE 2-3-2 INPUT GATE	80009	156-0182-02
A7A1U211	156-0688-01			MICROCIRCUIT,DI:DUAL J-K MASTER SLAVE FF	04713	SC22689L135
A7A1U213	156-0230-02			MICROCIRCUIT,DI:DUAL D-TYPE M/S,FF,SCRN	80009	156-0230-02
A7A1U215	156-0870-01			MICROCIRCUIT,DI:BCD DECADE CNTR,SCRN	07263	SL81658
A7A1U221	156-0458-01			MICROCIRCUIT,DI:QUAD AND GATE 2 INP,SCRN	04713	SC22689P104
A7A1U225	156-0368-03			MICROCIRCUIT,DI:TTL TO ECL QUAD TRANS	80009	156-0368-03
A7A1U235	156-0784-02			MICROCIRCUIT,DI:SYNC 4 BIT BINARY COUNTER	27014	DM74LS163ANA+
A7A1U241	156-1198-01			MICROCIRCUIT,DI:SYNCHRONOUS 4 BIT CNTR	01295	SN74S163J4
A7A1U245	156-0093-02			MICROCIRCUIT,DI:HEX INV BUFFER,BURN-IN	27014	DM8016
A7A1U251	156-0733-02			MICROCIRCUIT,DI:DUAL MONOSTABLE MV,BURN-IN	04713	SN74LS221N/J
A7A1U265	156-0388-03			MICROCIRCUIT,DI:DUAL D FLIP-FLOP	07263	74LS74A
A7A1U271	156-0424-02			MICROCIRCUIT,DI:QUAD 2 INP NOR BFR,SCRN	18324	N7433(NB OR FB)
A7A1U305	156-0759-02			MICROCIRCUIT,DI:QUAD 2-INP OR GATE,SCRN	04713	SC22689P103
A7A1U311	156-0458-01			MICROCIRCUIT,DI:QUAD AND GATE 2 INP,SCRN	04713	SC22689P104
A7A1U315	156-0638-01			MICROCIRCUIT,DI:FOUR-BIT UNIV SHIFT RGTR	04713	SC22689P141
A7A1U321	156-0638-01			MICROCIRCUIT,DI:FOUR-BIT UNIV SHIFT RGTR	04713	SC22689P141
A7A1U325	156-0638-01			MICROCIRCUIT,DI:FOUR-BIT UNIV SHIFT RGTR	04713	SC22689P141
A7A1U335	156-0784-02			MICROCIRCUIT,DI:SYNC 4 BIT BINARY COUNTER	27014	DM74LS163ANA+
A7A1U341	156-1198-01			MICROCIRCUIT,DI:SYNCHRONOUS 4 BIT CNTR	01295	SN74S163J4
A7A1U345	156-0331-03			MICROCIRCUIT,DI:DUAL D TYPE POSITIVE EDGE	80009	156-0331-03
A7A1U351	156-0382-02			MICROCIRCUIT,DI:QUAD 2-INP NAND GATE	01295	SN74LS00
A7A1U355	156-0784-02			MICROCIRCUIT,DI:SYNC 4 BIT BINARY COUNTER	27014	DM74LS163ANA+
A7A1U361	156-0388-03			MICROCIRCUIT,DI:DUAL D FLIP-FLOP	07263	74LS74A
A7A1U365	156-0479-02			MICROCIRCUIT,DI:QUAD 2-INP ORGATE	01295	SN74LS32NP3
A7A1U371	156-0451-02			MICROCIRCUIT,DI:QUAD 2-INP NOR BFR,SCRN	01295	SN74128
A7A1U405	156-0630-01			MICROCIRCUIT,DI:HEX INVERTER/BUFFER,SCRN	04713	SC22689P195
A7A1U411	156-0458-01			MICROCIRCUIT,DI:QUAD AND GATE 2 INP,SCRN	04713	SC22689P104
A7A1U415	156-0230-02			MICROCIRCUIT,DI:DUAL D-TYPE M/S,FF,SCRN	80009	156-0230-02
A7A1U421	156-0759-02			MICROCIRCUIT,DI:QUAD 2-INP OR GATE,SCRN	04713	SC22689P103
A7A1U425	156-0920-01			MICROCIRCUIT,DI:BIN TO 1-8 DECODER,SCRN	04713	SC22689P1L161
A7A1U435	156-0784-02			MICROCIRCUIT,DI:SYNC 4 BIT BINARY COUNTER	27014	DM74LS163ANA+
A7A1U441	156-1198-01			MICROCIRCUIT,DI:SYNCHRONOUS 4 BIT CNTR	01295	SN74S163J4
A7A1U445	156-0480-02			MICROCIRCUIT,DI:QUAD 2 INP & GATE	01295	SN74LS08NP3
A7A1U451	156-0392-03			MICROCIRCUIT,DI:QUAD LATCH W/CLEAR	01295	SN74S175NP3
A7A1U455	156-1386-01			MICROCIRCUIT,DI:CRT VIDEO TIMER CONT,SCRN	01295	9927JP4
A7A1U465	156-0383-02			MICROCIRCUIT,DI:QUAD 2-INP NOR GATE	01295	SN74LS02
A7A1U471	156-0469-02			MICROCIRCUIT,DI:3/8 LINE DCDR	01295	SN74LS138NP3
A7A1U505	156-0182-02			MICROCIRCUIT,DI:TRIPLE 2-3-2 INPUT GATE	80009	156-0182-02
A7A1U511	156-0688-01			MICROCIRCUIT,DI:DUAL J-K MASTER SLAVE FF	04713	SC22689L135
A7A1U515	156-0230-02			MICROCIRCUIT,DI:DUAL D-TYPE M/S,FF,SCRN	80009	156-0230-02
A7A1U521	156-0688-01			MICROCIRCUIT,DI:DUAL J-K MASTER SLAVE FF	04713	SC22689L135
A7A1U525	156-0368-03			MICROCIRCUIT,DI:TTL TO ECL QUAD TRANS	80009	156-0368-03
A7A1U535	156-0865-02			MICROCIRCUIT,DI:OCTAL D-TYPE FF W/CLEAR	01295	SN74LS273NP3
A7A1U541	156-0865-02			MICROCIRCUIT,DI:OCTAL D-TYPE FF W/CLEAR	01295	SN74LS273NP3
A7A1U545	156-0388-03			MICROCIRCUIT,DI:DUAL D FLIP-FLOP	07263	74LS74A
A7A1U551	160-1075-00			MICROCIRCUIT,DI:32 X 8 PROM,PROGRAMMED	80009	160-1075-00
A7A1U561	156-0530-02			MICROCIRCUIT,DI:QUAD 2 INP MUX	01295	SN74LS157P3
A7A1U565	156-0462-02			MICROCIRCUIT,DI:HEX INVERTER,SCREENED	01295	SN7414

A7A1 VIDEO CONTROLLER (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A7A1U571	156-0382-02			MICROCIRCUIT,DI:QUAD 2-INP NAND GATE	01295	SN74LS00
A7A1U605	156-0316-04			MICROCIRCUIT,DI:QUAD ECL TO TTL TRANS	80009	156-0316-04
A7A1U611	156-0316-04			MICROCIRCUIT,DI:QUAD ECL TO TTL TRANS	80009	156-0316-04
A7A1U615	156-0316-04			MICROCIRCUIT,DI:QUAD ECL TO TTL TRANS	80009	156-0316-04
A7A1U635	156-0391-02			MICROCIRCUIT,DI:HEX LATCH W/CLEAR	01295	SN74LS174
A7A1U641	156-0388-03			MICROCIRCUIT,DI:DUAL D FLIP-FLOP	07263	74LS74A
A7A1U645	156-0388-03			MICROCIRCUIT,DI:DUAL D FLIP-FLOP	07263	74LS74A
A7A1U651	156-0956-02			MICROCIRCUIT,DI:OCTAL BFR W/3 STATE OUT	01295	SN74LS244NP3
A7A1U655	156-0956-02			MICROCIRCUIT,DI:OCTAL BFR W/3 STATE OUT	01295	SN74LS244NP3
A7A1U661	156-0956-02			MICROCIRCUIT,DI:OCTAL BFR W/3 STATE OUT	01295	SN74LS244NP3
A7A1U665	156-0473-02			MICROCIRCUIT,DI:DUAL 5-INP NAND GATE,SCRN	27014	DM8092N/A+
A7A1U671	156-0985-01			MICROCIRCUIT,DI:DUAL 5 INPUT NOR GATE,SCRN	04713	SN74LS260
A7A1VR45	152-0278-00			SEMICOND DEVICE:ZENER,0.4W,3V,5%	04713	SZG35009K20
A7A1VR628	152-0667-00			SEMICOND DEVICE:ZENER,0.4W,3.0V,2%	80009	152-0667-00

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A8	670-6474-02			CKT BOARD ASSY:VECTOR GENERATOR	80009	670-6474-02
A8C10	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C20	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C30	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C40	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C70	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C75	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C80	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C105	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C140	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C175	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C210	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C215	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C230	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C240	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C260	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C270	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C275	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C310	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C315	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C325	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C335	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C375	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C385	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C415	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C420	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C430	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C440	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C460	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C465	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C480	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C490	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C505	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C520	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C530	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C540	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C555	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C560	283-0134-00			CAP.,FXD,CER DI:0.47UF,+80-20%,50V	72982	8131N087Z5U0474Z
A8C580	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C585	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A8C587	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A8J353	131-1857-00			TERM. SET,PIN:36/0.025 SQ PIN,ON 0.1 CTRS	22526	65500136
A8J354	131-1857-00			TERM. SET,PIN:36/0.025 SQ PIN,ON 0.1 CTRS	22526	65500136
A8J355	131-1857-00			TERM. SET,PIN:36/0.025 SQ PIN,ON 0.1 CTRS	22526	65500136
A8J356	131-1857-00			TERM. SET,PIN:36/0.025 SQ PIN,ON 0.1 CTRS	22526	65500136
A8J357	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
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A8R1	307-0540-00			RES,NTWK,FXD,FI:(5) 1K OHM,10%,0.7W	01121	206A102
A8R30	315-0330-00			RES.,FXD,CMPSN:33 OHM,5%,0.25W	01121	CB3305
A8R85	315-0330-00			RES.,FXD,CMPSN:33 OHM,5%,0.25W	01121	CB3305
A8R185	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
A8R187	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A8R189	315-0330-00			RES.,FXD,CMPSN:33 OHM,5%,0.25W	01121	CB3305
A8R255	315-0330-00			RES.,FXD,CMPSN:33 OHM,5%,0.25W	01121	CB3305
A8R587	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A8U10	156-0385-02			MICROCIRCUIT,DI:HEX INVERTER	01295	SN74LS04
A8U15	156-0865-02			MICROCIRCUIT,DI:OCTAL D-TYPE FF W/CLEAR	01295	SN74LS273NP3

A8 VECTOR GENERATOR (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A8U30	156-0385-02			MICROCIRCUIT,DI:HEX INVERTER	01295	SN74LS04
A8U35	156-0679-01			MICROCIRCUIT,DI:4 BIT BINARY ADDER,BURN-IN	04713	SN74LS283NDS
A8U40	156-0382-02			MICROCIRCUIT,DI:QUAD 2-INP NAND GATE	01295	SN74LS00
A8U45	156-1375-01			MICROCIRCUIT,DI:4 BIT BIN UP-DOWN CNTR	34335	AM25LS2569PCB
A8U50	156-1375-01			MICROCIRCUIT,DI:4 BIT BIN UP-DOWN CNTR	34335	AM25LS2569PCB
A8U55	160-1042-00			MICROCIRCUIT,DI:512 X 8 PROM,PROGRAMMED	80009	160-1042-00
A8U60	156-0913-02			MICROCIRCUIT,DI:OCTAL D FF,BURN-IN	04713	SN74LS377NDS
A8U65	160-1041-00			MICROCIRCUIT,DI:512 X 8 PROM,PROGRAMMED	80009	160-1041-00
A8U70	160-1040-00			MICROCIRCUIT,DI:512 X 8 PROM,PROGRAMMED	80009	160-1040-00
A8U75	156-1209-01			MICROCIRCUIT,DI:MICROPROGRAM SEQ,SCRN	34335	AM2911ADCB
A8U80	156-1209-01			MICROCIRCUIT,DI:MICROPROGRAM SEQ,SCRN	34335	AM2911ADCB
A8U105	156-0679-01			MICROCIRCUIT,DI:4 BIT BINARY ADDER,BURN-IN	04713	SN74LS283NDS
A8U115	156-0956-02			MICROCIRCUIT,DI:OCTAL BFR W/3 STATE OUT	01295	SN74LS244NP3
A8U120	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A8U125	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A8U130	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A8U135	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A8U140	156-0385-02			MICROCIRCUIT,DI:HEX INVERTER	01295	SN74LS04
A8U145	156-1375-01			MICROCIRCUIT,DI:4 BIT BIN UP-DOWN CNTR	34335	AM25LS2569PCB
A8U150	156-1375-01			MICROCIRCUIT,DI:4 BIT BIN UP-DOWN CNTR	34335	AM25LS2569PCB
A8U155	156-0913-02			MICROCIRCUIT,DI:OCTAL D FF,BURN-IN	04713	SN74LS377NDS
A8U160	156-0913-02			MICROCIRCUIT,DI:OCTAL D FF,BURN-IN	04713	SN74LS377NDS
A8U165	156-1046-02			MICROCIRCUIT,DI:OCTAL D-TYPE EDGE TRIG FF	80009	156-1046-02
A8U170	156-1046-02			MICROCIRCUIT,DI:OCTAL D-TYPE EDGE TRIG FF	80009	156-1046-02
A8U175	160-1043-00			MICROCIRCUIT,DI:32 X 8 PROM,PROGRAMMED	80009	160-1043-00
A8U180	156-1046-02			MICROCIRCUIT,DI:OCTAL D-TYPE EDGE TRIG FF	80009	156-1046-02
A8U205	156-0865-02			MICROCIRCUIT,DI:OCTAL D-TYPE FF W/CLEAR	01295	SN74LS273NP3
A8U210	156-0679-01			MICROCIRCUIT,DI:4 BIT BINARY ADDER,BURN-IN	04713	SN74LS283NDS
A8U215	156-0679-01			MICROCIRCUIT,DI:4 BIT BINARY ADDER,BURN-IN	04713	SN74LS283NDS
A8U220	156-0956-02			MICROCIRCUIT,DI:OCTAL BFR W/3 STATE OUT	01295	SN74LS244NP3
A8U225	156-0323-02			MICROCIRCUIT,DI:HEX INVERTER,BURN-IN	01295	SN74S04
A8U230	156-0479-02			MICROCIRCUIT,DI:QUAD 2-INP ORGATE	01295	SN74LS32NP3
A8U235	156-0386-02			MICROCIRCUIT,DI:TRIPLE 3 INP NAND GATE	01295	SN74LS10NP3
A8U240	156-0388-03			MICROCIRCUIT,DI:DUAL D FLIP-FLOP	07263	74LS74A
A8U245	156-1065-01			MICROCIRCUIT,DI:OCTAL D TYPE TRANS LATCHES	34335	AM74LS373
A8U250	156-1375-01			MICROCIRCUIT,DI:4 BIT BIN UP-DOWN CNTR	34335	AM25LS2569PCB
A8U255	156-0392-03			MICROCIRCUIT,DI:QUAD LATCH W/CLEAR	01295	SN74S175NP3
A8U260	156-0480-02			MICROCIRCUIT,DI:QUAD 2 INP & GATE	01295	SN74LS08NP3
A8U265	156-0696-02			MICROCIRCUIT,DI:QUAD CMPLM-OUTPUT & NAND	01295	SN74265J4
A8U270	156-0331-03			MICROCIRCUIT,DI:DUAL D TYPE POSITIVE EDGE	80009	156-0331-03
A8U275	156-0994-02			MICROCIRCUIT,DI:8 INPUT DATA SEL/MUX	01295	SN74LS151NP3
A8U280	156-0388-03			MICROCIRCUIT,DI:DUAL D FLIP-FLOP	07263	74LS74A
A8U285	156-0721-02			MICROCIRCUIT,DI:QUAD 2-IN NAND SCHMITT TRI	04713	SN74LS132NDS
A8U300	156-0975-02			MICROCIRCUIT,DI:UNIV SHIFT/STORAGE RGTR	01295	SN74LS299N3/J4
A8U305	156-0975-02			MICROCIRCUIT,DI:UNIV SHIFT/STORAGE RGTR	01295	SN74LS299N3/J4
A8U310	160-1047-00			MICROCIRCUIT,DI:256 X 4 PROM,PROGRAMMED	80009	160-1047-00
A8U315	160-1046-00			MICROCIRCUIT,DI:256 X 4 PROM,PROGRAMMED	80009	160-1046-00
A8U320	156-0957-01			MICROCIRCUIT,DI:SYN 4 BIT UP/DOWN BINARY	27014	DM74LS169
A8U325	156-0957-01			MICROCIRCUIT,DI:SYN 4 BIT UP/DOWN BINARY	27014	DM74LS169
A8U330	156-1065-01			MICROCIRCUIT,DI:OCTAL D TYPE TRANS LATCHES	34335	AM74LS373
A8U335	156-0718-03			MICROCIRCUIT,DI:TRIPLE 3-INP NOR GATE	01295	SN74LS27
A8U340	156-0479-02			MICROCIRCUIT,DI:QUAD 2-INP ORGATE	01295	SN74LS32NP3
A8U345	156-1375-01			MICROCIRCUIT,DI:4 BIT BIN UP-DOWN CNTR	34335	AM25LS2569PCB
A8U350	156-1375-01			MICROCIRCUIT,DI:4 BIT BIN UP-DOWN CNTR	34335	AM25LS2569PCB
A8U355	156-1375-01			MICROCIRCUIT,DI:4 BIT BIN UP-DOWN CNTR	34335	AM25LS2569PCB
A8U360	156-1375-01			MICROCIRCUIT,DI:4 BIT BIN UP-DOWN CNTR	34335	AM25LS2569PCB
A8U365	156-1375-01			MICROCIRCUIT,DI:4 BIT BIN UP-DOWN CNTR	34335	AM25LS2569PCB

A8 VECTOR GENERATOR (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A8U370	156-0469-02			MICROCIRCUIT,DI:3/8 LINE DCDR	01295	SN74LS138NP3
A8U375	156-0469-02			MICROCIRCUIT,DI:3/8 LINE DCDR	01295	SN74LS138NP3
A8U380	156-0469-02			MICROCIRCUIT,DI:3/8 LINE DCDR	01295	SN74LS138NP3
A8U385	156-0392-03			MICROCIRCUIT,DI:QUAD LATCH W/CLEAR	01295	SN74S175NP3
A8U400	156-0975-02			MICROCIRCUIT,DI:UNIV SHIFT/STORAGE RGTR	01295	SN74LS299N3/J4
A8U405	156-0975-02			MICROCIRCUIT,DI:UNIV SHIFT/STORAGE RGTR	01295	SN74LS299N3/J4
A8U410	156-0382-02			MICROCIRCUIT,DI:QUAD 2-INP NAND GATE	01295	SN74LS00
A8U415	156-0388-03			MICROCIRCUIT,DI:DUAL D FLIP-FLOP	07263	74LS74A
A8U420	156-0480-02			MICROCIRCUIT,DI:QUAD 2 INP & GATE	01295	SN74LS08NP3
A8U425	156-0388-03			MICROCIRCUIT,DI:DUAL D FLIP-FLOP	07263	74LS74A
A8U430	156-0739-02			MICROCIRCUIT,DI:QUAD 2 INP OR GATE,SCRN	01295	SN74S32
A8U435	156-0956-02			MICROCIRCUIT,DI:OCTAL BFR W/3 STATE OUT	01295	SN74LS244NP3
A8U440	156-0388-03			MICROCIRCUIT,DI:DUAL D FLIP-FLOP	07263	74LS74A
A8U445	156-1065-01			MICROCIRCUIT,DI:OCTAL D TYPE TRANS LATCHES	34335	AM74LS373
A8U450	156-1371-00			MICROCIRCUIT,DI:SYN 4 BIT W/UP/DOWN CTR	04713	SN74LS168NDS
A8U455	156-1375-01			MICROCIRCUIT,DI:4 BIT BIN UP-DOWN CNTR	34335	AM25LS2569PCB
A8U460	156-0852-02			MICROCIRCUIT,DI:HEX DRVR W/3 STATE INP	80009	156-0852-02
A8U465	156-0852-02			MICROCIRCUIT,DI:HEX DRVR W/3 STATE INP	80009	156-0852-02
A8U470	156-0865-02			MICROCIRCUIT,DI:OCTAL D-TYPE FF W/CLEAR	01295	SN74LS273NP3
A8U475	156-0865-02			MICROCIRCUIT,DI:OCTAL D-TYPE FF W/CLEAR	01295	SN74LS273NP3
A8U480	156-0480-02			MICROCIRCUIT,DI:QUAD 2 INP & GATE	01295	SN74LS08NP3
A8U485	156-0469-02			MICROCIRCUIT,DI:3/8 LINE DCDR	01295	SN74LS138NP3
A8U490	156-0985-01			MICROCIRCUIT,DI:DUAL 5 INPUT NOR GATE,SCRN	04713	SN74LS260
A8U505	156-0392-03			MICROCIRCUIT,DI:QUAD LATCH W/CLEAR	01295	SN74S175NP3
A8U510	156-0989-02			MICROCIRCUIT,DI:4 X 4 RGTR FILE,BURN-IN	04713	SN74LS670NDS
A8U515	156-0956-02			MICROCIRCUIT,DI:OCTAL BFR W/3 STATE OUT	01295	SN74LS244NP3
A8U520	156-0392-03			MICROCIRCUIT,DI:QUAD LATCH W/CLEAR	01295	SN74S175NP3
A8U525	156-0392-03			MICROCIRCUIT,DI:QUAD LATCH W/CLEAR	01295	SN74S175NP3
A8U530	156-0989-02			MICROCIRCUIT,DI:4 X 4 RGTR FILE,BURN-IN	04713	SN74LS670NDS
A8U535	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A8U540	156-0989-02			MICROCIRCUIT,DI:4 X 4 RGTR FILE,BURN-IN	04713	SN74LS670NDS
A8U545	156-0720-02			MICROCIRCUIT,DI:HEX DRVR,4 TO 2 LINE	01295	SN74LS368
A8U550	156-0956-02			MICROCIRCUIT,DI:OCTAL BFR W/3 STATE OUT	01295	SN74LS244NP3
A8U555	156-0381-02			MICROCIRCUIT,DI:QUAD 2-INP EXCL OR GATE	01295	SN74LS86
A8U560	156-1111-02			MICROCIRCUIT,DI:OCTAL BUS TRANSCEIVERS	80009	156-1111-02
A8U565	156-1111-02			MICROCIRCUIT,DI:OCTAL BUS TRANSCEIVERS	80009	156-1111-02
A8U570	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A8U575	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A8U580	156-0383-02			MICROCIRCUIT,DI:QUAD 2-INP NOR GATE	01295	SN74LS02
A8U585	156-0385-02			MICROCIRCUIT,DI:HEX INVERTER	01295	SN74LS04

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A9	670-7568-00			CKT BOARD ASSY:SINGLE RASTERMEMORY	80009	670-7568-00
A9C101	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C102	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A9C107	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C117	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C124	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C134	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C151	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C161	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C167	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C174	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C184	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C204	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C211	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C218	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C224	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C254	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C261	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C268	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C274	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C285	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A9C301	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A9C304	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C308	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C311	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C315	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C317	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C322	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C324	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C328	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C331	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C348	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A9C355	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C357	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C362	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C364	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C368	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C371	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C375	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C377	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C382	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C385	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A9C476	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C483	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C503	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C513	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C520	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C530	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C546	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C553	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C566	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C576	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C613	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C680	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C683	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C700	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C703	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z

A9 SINGLE RASTERMEMORY (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A9C706	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C716	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C721	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A9C724	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C726	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C736	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C746	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C747	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C751	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A9C753	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C760	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C766	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9C773	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A9CR609	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A9J707	131-0608-00 ----- -----			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QUANTITY OF 4)	22526	47357
A9J708	131-0608-00 ----- -----			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QUANTITY OF 2)	22526	47357
A9J717	131-0608-00 ----- -----			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QUANTITY OF 4)	22526	47357
A9J718	131-0608-00 ----- -----			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QUANTITY OF 2)	22526	47357
A9Q615	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A9Q616	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A9R101	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A9R102	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A9R106	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
A9R107	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A9R108	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A9R117	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A9R118	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A9R124	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A9R125	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A9R134	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A9R135	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A9R147	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A9R148	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A9R154	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A9R155	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A9R164	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A9R165	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A9R171	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A9R172	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A9R177	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A9R178	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A9R247	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
A9R248	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
A9R333	315-0430-00			RES.,FXD,CMPSN:43 OHM,5%,0.25W	01121	CB4305
A9R334	315-0430-00			RES.,FXD,CMPSN:43 OHM,5%,0.25W	01121	CB4305
A9R335	315-0180-00			RES.,FXD,CMPSN:18 OHM,5%,0.25W	01121	CB1805
A9R336	315-0180-00			RES.,FXD,CMPSN:18 OHM,5%,0.25W	01121	CB1805
A9R337	315-0180-00			RES.,FXD,CMPSN:18 OHM,5%,0.25W	01121	CB1805
A9R338	315-0180-00			RES.,FXD,CMPSN:18 OHM,5%,0.25W	01121	CB1805
A9R339	315-0180-00			RES.,FXD,CMPSN:18 OHM,5%,0.25W	01121	CB1805
A9R340	315-0180-00			RES.,FXD,CMPSN:18 OHM,5%,0.25W	01121	CB1805
A9R341	315-0180-00			RES.,FXD,CMPSN:18 OHM,5%,0.25W	01121	CB1805
A9R472	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725

A9 SINGLE RASTERMEMORY (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A9R607	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A9R608	315-0101-03			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A9R610	315-0101-03			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A9R611	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A9R612	315-0101-03			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A9R614	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A9R618	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A9R619	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A9R620	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A9R621	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A9R624	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
A9R625	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
A9R626	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
A9R627	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
A9R631	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A9R632	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A9R635	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A9R636	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A9R675	307-0445-00			RES NTWK,FXD,FI:4.7K OHM,20%,(9) RES	91637	MSP10A01-472M
A9R712	315-0101-03			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A9R785	131-0566-00			BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1
A9R786	131-0566-00			BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1
A9U143	156-1058-01			MICROCIRCUIT,DI:OCTAL ST BFR W/3 STATE OUT	01295	SN74S240JP4
A9U300	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A9U303	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A9U306	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A9U310	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A9U313	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A9U316	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A9U320	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A9U323	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A9U326	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A9U330	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A9U343	156-1351-01			MICROCIRCUIT,DI:QUAD 2 TO 1 LINE DATA,SCRN	27014	DM74S158
A9U346	156-1351-01			MICROCIRCUIT,DI:QUAD 2 TO 1 LINE DATA,SCRN	27014	DM74S158
A9U353	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A9U356	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A9U360	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A9U363	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A9U366	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A9U370	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A9U373	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A9U376	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A9U380	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A9U383	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A9U400	156-1351-01			MICROCIRCUIT,DI:QUAD 2 TO 1 LINE DATA,SCRN	27014	DM74S158
A9U403	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A9U406	156-0874-02			MICROCIRCUIT,DI:8 BIT ADDRESSABLE LCH	80009	156-0874-02
A9U410	156-0693-02			MICROCIRCUIT,DI:DECODER/DEMULTIPLEXER	27014	DM74S139
A9U413	156-1351-01			MICROCIRCUIT,DI:QUAD 2 TO 1 LINE DATA,SCRN	27014	DM74S158
A9U416	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A9U420	156-0874-02			MICROCIRCUIT,DI:8 BIT ADDRESSABLE LCH	80009	156-0874-02
A9U423	156-0874-02			MICROCIRCUIT,DI:8 BIT ADDRESSABLE LCH	80009	156-0874-02
A9U426	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A9U430	156-1351-01			MICROCIRCUIT,DI:QUAD 2 TO 1 LINE DATA,SCRN	27014	DM74S158
A9U436	156-0382-02			MICROCIRCUIT,DI:QUAD 2-INP NAND GATE	01295	SN74LS00
A9U443	156-0874-02			MICROCIRCUIT,DI:8 BIT ADDRESSABLE LCH	80009	156-0874-02

A9 SINGLE RASTERMEMORY (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A9U446	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A9U450	156-1351-01			MICROCIRCUIT,DI:QUAD 2 TO 1 LINE DATA,SCRN	27014	DM74S158
A9U453	156-1065-01			MICROCIRCUIT,DI:OCTAL D TYPE TRANS LATCHES	34335	AM74LS373
A9U456	156-1481-00			MICROCIRCUIT,DI:8-BIT REGISTER,SCRN	34335	AM25LS22
A9U470	156-1351-01			MICROCIRCUIT,DI:QUAD 2 TO 1 LINE DATA,SCRN	27014	DM74S158
A9U476	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A9U483	156-0874-02			MICROCIRCUIT,DI:8 BIT ADDRESSABLE LCH	80009	156-0874-02
A9U503	156-1376-00			MICROCIRCUIT,DI:ARITH LOGIC UNIT/FCTN GEN	04713	SN74LS181
A9U513	156-1376-00			MICROCIRCUIT,DI:ARITH LOGIC UNIT/FCTN GEN	04713	SN74LS181
A9U530	156-1376-00			MICROCIRCUIT,DI:ARITH LOGIC UNIT/FCTN GEN	04713	SN74LS181
A9U546	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A9U550	156-0874-02			MICROCIRCUIT,DI:8 BIT ADDRESSABLE LCH	80009	156-0874-02
A9U553	156-1376-00			MICROCIRCUIT,DI:ARITH LOGIC UNIT/FCTN GEN	04713	SN74LS181
A9U566	156-1065-01			MICROCIRCUIT,DI:OCTAL D TYPE TRANS LATCHES	34335	AM74LS373
A9U576	156-1376-00			MICROCIRCUIT,DI:ARITH LOGIC UNIT/FCTN GEN	04713	SN74LS181
A9U600	156-1065-01			MICROCIRCUIT,DI:OCTAL D TYPE TRANS LATCHES	34335	AM74LS373
A9U603	156-1481-00			MICROCIRCUIT,DI:8-BIT REGISTER,SCRN	34335	AM25LS22
A9U680	156-0385-02			MICROCIRCUIT,DI:HEX INVERTER	01295	SN74LS04
A9U683	156-0390-02			MICROCIRCUIT,DI:DUAL 4/2 LINE DCDR/DEMUX	01295	SN74LS155
A9U700	156-0479-02			MICROCIRCUIT,DI:QUAD 2-INP ORGATE	01295	SN74LS32NP3
A9U703	156-0480-02			MICROCIRCUIT,DI:QUAD 2 INP & GATE	01295	SN74LS08NP3
A9U706	156-0041-05			MICROCIRCUIT,DI:DUAL D-TYPE FF,BURN-IN	01295	SN7474
A9U710	156-0230-02			MICROCIRCUIT,DI:DUAL D-TYPE M/S,FF,SCRN	80009	156-0230-02
A9U713	156-0368-03			MICROCIRCUIT,DI:TTL TO ECL QUAD TRANS	80009	156-0368-03
A9U716	156-0316-04			MICROCIRCUIT,DI:QUAD ECL TO TTL TRANS	80009	156-0316-04
A9U720	156-0316-04			MICROCIRCUIT,DI:QUAD ECL TO TTL TRANS	80009	156-0316-04
A9U723	156-0320-03			MICROCIRCUIT,DI:TRIPLE 3 INP NAND GATE	01295	SN74S11NP3
A9U726	156-0382-02			MICROCIRCUIT,DI:QUAD 2-INP NAND GATE	01295	SN74LS00
A9U730	156-0385-02			MICROCIRCUIT,DI:HEX INVERTER	01295	SN74LS04
A9U736	156-1481-00			MICROCIRCUIT,DI:8-BIT REGISTER,SCRN	34335	AM25LS22
A9U743	156-0955-02			MICROCIRCUIT,DI:OCTAL BFR W/3 STATE OUT	04713	SN74LS241
A9U753	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A9U756	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A9U760	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A9U763	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A9U776	156-0041-05			MICROCIRCUIT,DI:DUAL D-TYPE FF,BURN-IN	01295	SN7474
A9U780	156-0866-02			MICROCIRCUIT,DI:13 INP NAND GATES,SCRN	80009	156-0866-02
A9W679	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QUANTITY OF 3)	22526	47357
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A9W680	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QUANTITY OF 3)	22526	47357
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Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A10	670-6476-01			CKT BOARD ASSY:DUAL RASTER MEMORY PLANE	80009	670-6476-01
A10C101	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C102	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A10C107	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C117	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C124	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C134	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C151	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C161	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C167	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C174	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C184	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C204	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C211	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C218	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C224	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C254	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C261	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C268	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C274	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C285	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A10C301	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A10C304	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C308	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C315	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C317	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C322	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C324	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C328	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C331	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C348	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A10C355	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C357	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C362	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C364	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C368	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C371	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C375	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C377	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C382	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C385	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A10C476	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C483	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C503	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C513	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C520	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C530	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C546	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C553	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C566	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C576	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C613	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C680	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C683	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C700	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C703	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C706	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z

A10 DUAL RASTER MEMORY PLANE (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A10C716	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C721	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A10C724	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C726	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C736	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C746	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C747	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C751	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A10C753	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C760	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C766	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10C773	283-0423-00			CAP.,FXD,CER DI:0.22UF,+80-20%,50V	04222	DG015E224Z
A10CR609	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A10J707	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 4)		
A10J708	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 2)		
A10J717	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 4)		
A10J718	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 2)		
A10Q615	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A10Q616	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A10R101	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A10R102	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A10R106	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
A10R107	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A10R108	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A10R117	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A10R118	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A10R124	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A10R125	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A10R134	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A10R135	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A10R147	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A10R148	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A10R154	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A10R155	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A10R164	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A10R165	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A10R171	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A10R172	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A10R177	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A10R178	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A10R231	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
A10R232	315-0430-00			RES.,FXD,CMPSN:43 OHM,5%,0.25W	01121	CB4305
A10R241	315-0430-00			RES.,FXD,CMPSN:43 OHM,5%,0.25W	01121	CB4305
A10R242	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
A10R247	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
A10R248	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
A10R333	315-0430-00			RES.,FXD,CMPSN:43 OHM,5%,0.25W	01121	CB4305
A10R334	315-0430-00			RES.,FXD,CMPSN:43 OHM,5%,0.25W	01121	CB4305
A10R335	315-0180-00			RES.,FXD,CMPSN:18 OHM,5%,0.25W	01121	CB1805
A10R336	315-0180-00			RES.,FXD,CMPSN:18 OHM,5%,0.25W	01121	CB1805
A10R337	315-0180-00			RES.,FXD,CMPSN:18 OHM,5%,0.25W	01121	CB1805
A10R338	315-0180-00			RES.,FXD,CMPSN:18 OHM,5%,0.25W	01121	CB1805
A10R339	315-0180-00			RES.,FXD,CMPSN:18 OHM,5%,0.25W	01121	CB1805

A10 DUAL RASTER MEMORY PLANE (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A10R340	315-0180-00			RES.,FXD,CMPSN:18 OHM,5%,0.25W	01121	CB1805
A10R341	315-0180-00			RES.,FXD,CMPSN:18 OHM,5%,0.25W	01121	CB1805
A10R472	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
A10R607	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A10R608	315-0101-03			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A10R610	315-0101-03			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A10R611	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A10R612	315-0101-03			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A10R614	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A10R618	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A10R619	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A10R620	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A10R621	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A10R624	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
A10R625	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
A10R626	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
A10R627	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
A10R631	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A10R632	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A10R635	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A10R636	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A10R675	307-0445-00			RES NTWK,FXD,FI:4.7K OHM,20%,(9) RES	91637	MSP10A01-472M
A10R712	315-0101-03			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A10R785	131-0566-00			BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1
A10R786	131-0566-00			BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	55210	L-2007-1
A10U100	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U103	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U106	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U113	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U116	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U120	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U123	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U126	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U133	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U140	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U143	156-1058-01			MICROCIRCUIT,DI:OCTAL ST BFR W/3 STATE OUT	01295	SN74S240JP4
A10U146	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U150	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U153	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U160	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U163	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U166	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U170	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U173	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U176	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U183	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U300	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U303	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U306	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U310	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U313	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U316	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U320	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U323	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U326	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U330	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U343	156-1351-01			MICROCIRCUIT,DI:QUAD 2 TO 1 LINE DATA,SCRN	27014	DM74S158

A10 DUAL RASTER MEMORY PLANE (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A10U346	156-1351-01			MICROCIRCUIT,DI:QUAD 2 TO 1 LINE DATA,SCRN	27014	DM74S158
A10U353	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U356	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U360	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U363	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U366	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U370	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U373	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U376	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U380	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U383	156-1552-00			MICROCIRCUIT,DI:HMOS,16384 X 1 DRAM	34649	D2118-4
A10U400	156-1351-01			MICROCIRCUIT,DI:QUAD 2 TO 1 LINE DATA,SCRN	27014	DM74S158
A10U403	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A10U406	156-0874-02			MICROCIRCUIT,DI:8 BIT ADDRESSABLE LCH	80009	156-0874-02
A10U410	156-0693-02			MICROCIRCUIT,DI:DECODER/DEMULTIPLEXER	27014	DM74S139
A10U413	156-1351-01			MICROCIRCUIT,DI:QUAD 2 TO 1 LINE DATA,SCRN	27014	DM74S158
A10U416	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A10U420	156-0874-02			MICROCIRCUIT,DI:8 BIT ADDRESSABLE LCH	80009	156-0874-02
A10U423	156-0874-02			MICROCIRCUIT,DI:8 BIT ADDRESSABLE LCH	80009	156-0874-02
A10U426	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A10U430	156-1351-01			MICROCIRCUIT,DI:QUAD 2 TO 1 LINE DATA,SCRN	27014	DM74S158
A10U436	156-0382-02			MICROCIRCUIT,DI:QUAD 2-INP NAND GATE	01295	SN74LS00
A10U443	156-0874-02			MICROCIRCUIT,DI:8 BIT ADDRESSABLE LCH	80009	156-0874-02
A10U446	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A10U450	156-1351-01			MICROCIRCUIT,DI:QUAD 2 TO 1 LINE DATA,SCRN	27014	DM74S158
A10U453	156-1065-01			MICROCIRCUIT,DI:OCTAL D TYPE TRANS LATCHES	34335	AM74LS373
A10U456	156-1481-00			MICROCIRCUIT,DI:8-BIT REGISTER,SCRN	34335	AM25LS22
A10U460	156-1481-00			MICROCIRCUIT,DI:8-BIT REGISTER,SCRN	34335	AM25LS22
A10U463	156-1065-01			MICROCIRCUIT,DI:OCTAL D TYPE TRANS LATCHES	34335	AM74LS373
A10U466	156-0874-02			MICROCIRCUIT,DI:8 BIT ADDRESSABLE LCH	80009	156-0874-02
A10U470	156-1351-01			MICROCIRCUIT,DI:QUAD 2 TO 1 LINE DATA,SCRN	27014	DM74S158
A10U476	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A10U480	156-0874-02			MICROCIRCUIT,DI:8 BIT ADDRESSABLE LCH	80009	156-0874-02
A10U483	156-0874-02			MICROCIRCUIT,DI:8 BIT ADDRESSABLE LCH	80009	156-0874-02
A10U503	156-1376-00			MICROCIRCUIT,DI:ARITH LOGIC UNIT/FCTN GEN	04713	SN74LS181
A10U510	156-1376-00			MICROCIRCUIT,DI:ARITH LOGIC UNIT/FCTN GEN	04713	SN74LS181
A10U513	156-1376-00			MICROCIRCUIT,DI:ARITH LOGIC UNIT/FCTN GEN	04713	SN74LS181
A10U516	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A10U520	156-0874-02			MICROCIRCUIT,DI:8 BIT ADDRESSABLE LCH	80009	156-0874-02
A10U523	156-1376-00			MICROCIRCUIT,DI:ARITH LOGIC UNIT/FCTN GEN	04713	SN74LS181
A10U530	156-1376-00			MICROCIRCUIT,DI:ARITH LOGIC UNIT/FCTN GEN	04713	SN74LS181
A10U543	156-1376-00			MICROCIRCUIT,DI:ARITH LOGIC UNIT/FCTN GEN	04713	SN74LS181
A10U546	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A10U550	156-0874-02			MICROCIRCUIT,DI:8 BIT ADDRESSABLE LCH	80009	156-0874-02
A10U553	156-1376-00			MICROCIRCUIT,DI:ARITH LOGIC UNIT/FCTN GEN	04713	SN74LS181
A10U560	156-1376-00			MICROCIRCUIT,DI:ARITH LOGIC UNIT/FCTN GEN	04713	SN74LS181
A10U566	156-1065-01			MICROCIRCUIT,DI:OCTAL D TYPE TRANS LATCHES	34335	AM74LS373
A10U570	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A10U576	156-1376-00			MICROCIRCUIT,DI:ARITH LOGIC UNIT/FCTN GEN	04713	SN74LS181
A10U580	156-1376-00			MICROCIRCUIT,DI:ARITH LOGIC UNIT/FCTN GEN	04713	SN74LS181
A10U600	156-1065-01			MICROCIRCUIT,DI:OCTAL D TYPE TRANS LATCHES	34335	AM74LS373
A10U603	156-1481-00			MICROCIRCUIT,DI:8-BIT REGISTER,SCRN	34335	AM25LS22
A10U606	156-1481-00			MICROCIRCUIT,DI:8-BIT REGISTER,SCRN	34335	AM25LS22
A10U613	156-1065-01			MICROCIRCUIT,DI:OCTAL D TYPE TRANS LATCHES	34335	AM74LS373
A10U680	156-0385-02			MICROCIRCUIT,DI:HEX INVERTER	01295	SN74LS04
A10U683	156-0390-02			MICROCIRCUIT,DI:DUAL 4/2 LINE DCDR/DEMUX	01295	SN74LS155
A10U700	156-0479-02			MICROCIRCUIT,DI:QUAD 2-INP ORGATE	01295	SN74LS32NP3

A10 DUAL RASTER MEMORY PLANE (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A10U703	156-0480-02			MICROCIRCUIT,DI:QUAD 2 INP & GATE	01295	SN74LS08NP3
A10U706	156-0041-05			MICROCIRCUIT,DI:DUAL D-TYPE FF,BURN-IN	01295	SN7474
A10U710	156-0230-02			MICROCIRCUIT,DI:DUAL D-TYPE M/S,FF,SCRN	80009	156-0230-02
A10U713	156-0368-03			MICROCIRCUIT,DI:TTL TO ECL QUAD TRANS	80009	156-0368-03
A10U716	156-0316-04			MICROCIRCUIT,DI:QUAD ECL TO TTL TRANS	80009	156-0316-04
A10U720	156-0316-04			MICROCIRCUIT,DI:QUAD ECL TO TTL TRANS	80009	156-0316-04
A10U723	156-0320-03			MICROCIRCUIT,DI:TRIPLE 3 INP NAND GATE	01295	SN74S11NP3
A10U726	156-0382-02			MICROCIRCUIT,DI:QUAD 2-INP NAND GATE	01295	SN74LS00
A10U730	156-0385-02			MICROCIRCUIT,DI:HEX INVERTER	01295	SN74LS04
A10U736	156-1481-00			MICROCIRCUIT,DI:8-BIT REGISTER,SCRN	34335	AM25LS22
A10U743	156-0955-02			MICROCIRCUIT,DI:OCTAL BFR W/3STATE OUT	04713	SN74LS241
A10U746	156-1065-01			MICROCIRCUIT,DI:OCTAL D TYPE TRANS LATCHES	34335	AM74LS373
A10U750	156-1481-00			MICROCIRCUIT,DI:8-BIT REGISTER,SCRN	34335	AM25LS22
A10U753	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A10U756	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A10U760	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A10U763	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A10U766	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A10U770	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A10U773	156-0982-03			MICROCIRCUIT,DI:OCTAL-D-EDGE FF,SCRN	07263	74LS374
A10U776	156-0041-05			MICROCIRCUIT,DI:DUAL D-TYPE FF,BURN-IN	01295	SN7474
A10U780	156-0866-02			MICROCIRCUIT,DI:13 INP NAND GATES,SCRN	80009	156-0866-02
A10W679	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 3)		
A10W680	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 3)		

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A11	670-7567-00			CKT BOARD ASSY:COLOR MAP	80009	670-7567-00
A11C1	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C16	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C27	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C45	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C65	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C100	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C116	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C127	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C145	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C157	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C158	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C165	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C200	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C201	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C204	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C205	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C208	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C209	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C216	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C227	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C228	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C234	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C235	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C237	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C238	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C244	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C245	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C247	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C248	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C253	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C254	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C262	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A11C264	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A11C266	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A11C268	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A11C315	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C318	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C405	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C415	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C420	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C435	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C445	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C460	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C465	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C470	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C510	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C515	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C520	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C525	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C535	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C555	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C560	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C565	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C600	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A11C601	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C603	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z

A11 COLOR MAP (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A11C607	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C608	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C616	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A11C617	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C618	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C620	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C630	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C640	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C645	290-0745-00			CAP.,FXD,ELCTLT:22UF,+50-10%,25V	56289	502D225
A11C647	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C650	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C657	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11C660	283-0421-00			CAP.,FXD,CER DI:0.1UF,+80-20%,50V	04222	DG015E104Z
A11CR643	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A11J422	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 10)		
A11J423	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ	22526	47350
	----- -----			(QUANTITY OF 10)		
A11J424	131-2306-00			CONN,RCPT,ELEC:CKT BD,14 CONT,MALE,R ANGLE	00779	87230-7
A11J425	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ	22526	47350
	----- -----			(QUANTITY OF 2)		
A11J426	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ	22526	47350
	----- -----			(QUANTITY OF 2)		
A11J505	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 3)		
A11Q2	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q4	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q6	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A11Q18	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A11Q20	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A11Q34	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q36	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q39	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A11Q49	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q51	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q54	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A11Q102	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A11Q104	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q106	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A11Q118	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q120	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q134	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A11Q136	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q139	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A11Q149	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A11Q151	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q154	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A11Q218	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A11Q220	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q300	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q302	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q304	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q306	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q308	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q310	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q312	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q320	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K

A11 COLOR MAP (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A11Q330	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q332	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q334	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q336	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q338	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q340	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q342	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q346	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q348	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q350	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q352	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q354	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q356	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11Q358	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A11R1	321-0085-00			RES.,FXD,FILM:75 OHM,1%,0.125W	91637	MFF1816G75R00F
A11R6	321-0097-00			RES.,FXD,FILM:100 OHM,1%,0.125W	91637	MFF1816G100R0F
A11R10	321-0193-00			RES.,FXD,FILM:1K OHM,1%,0.125W	91637	MFF1816G10000F
A11R11	321-0085-00			RES.,FXD,FILM:75 OHM,1%,0.125W	91637	MFF1816G75R00F
A11R20	321-0085-00			RES.,FXD,FILM:75 OHM,1%,0.125W	91637	MFF1816G75R00F
A11R22	321-0085-00			RES.,FXD,FILM:75 OHM,1%,0.125W	91637	MFF1816G75R00F
A11R33	321-0085-00			RES.,FXD,FILM:75 OHM,1%,0.125W	91637	MFF1816G75R00F
A11R37	321-0097-00			RES.,FXD,FILM:100 OHM,1%,0.125W	91637	MFF1816G100R0F
A11R40	321-0193-00			RES.,FXD,FILM:1K OHM,1%,0.125W	91637	MFF1816G10000F
A11R41	321-0085-00			RES.,FXD,FILM:75 OHM,1%,0.125W	91637	MFF1816G75R00F
A11R47	321-0085-00			RES.,FXD,FILM:75 OHM,1%,0.125W	91637	MFF1816G75R00F
A11R53	321-0097-00			RES.,FXD,FILM:100 OHM,1%,0.125W	91637	MFF1816G100R0F
A11R55	321-0193-00			RES.,FXD,FILM:1K OHM,1%,0.125W	91637	MFF1816G10000F
A11R56	321-0085-00			RES.,FXD,FILM:75 OHM,1%,0.125W	91637	MFF1816G75R00F
A11R100	321-0108-00			RES.,FXD,FILM:130 OHM,1%,0.125W	91637	MFF1816G130R0F
A11R106	321-0097-00			RES.,FXD,FILM:100 OHM,1%,0.125W	91637	MFF1816G100R0F
A11R110	321-0193-00			RES.,FXD,FILM:1K OHM,1%,0.125W	91637	MFF1816G10000F
A11R111	321-0125-00			RES.,FXD,FILM:196 OHM,1%,0.125W	91637	MFF1816G196R0F
A11R120	321-0097-00			RES.,FXD,FILM:100 OHM,1%,0.125W	91637	MFF1816G100R0F
A11R122	321-0097-00			RES.,FXD,FILM:100 OHM,1%,0.125W	91637	MFF1816G100R0F
A11R133	321-0108-00			RES.,FXD,FILM:130 OHM,1%,0.125W	91637	MFF1816G130R0F
A11R137	321-0097-00			RES.,FXD,FILM:100 OHM,1%,0.125W	91637	MFF1816G100R0F
A11R140	321-0193-00			RES.,FXD,FILM:1K OHM,1%,0.125W	91637	MFF1816G10000F
A11R141	321-0097-00			RES.,FXD,FILM:100 OHM,1%,0.125W	91637	MFF1816G100R0F
A11R147	321-0108-00			RES.,FXD,FILM:130 OHM,1%,0.125W	91637	MFF1816G130R0F
A11R153	321-0097-00			RES.,FXD,FILM:100 OHM,1%,0.125W	91637	MFF1816G100R0F
A11R155	321-0193-00			RES.,FXD,FILM:1K OHM,1%,0.125W	91637	MFF1816G10000F
A11R156	321-0167-00			RES.,FXD,FILM:536 OHM,1%,0.125W	91637	MFF1816G536R0F
A11R202	321-0145-00			RES.,FXD,FILM:316 OHM,1%,0.125W	91637	MFF1816G316R0F
A11R203	321-0641-00			RES.,FXD,FILM:1.8K OHM,1%,0.125W	91637	MFF1816G18000F
A11R205	321-0227-00			RES.,FXD,FILM:2.26K OHM,1%,0.125W	91637	MFF1816G22600F
A11R206	321-0198-00			RES.,FXD,FILM:1.13K OHM,1%,0.125W	91637	MFF1816G11300F
A11R210	321-0169-00			RES.,FXD,FILM:562 OHM,1%,0.125W	91637	MFF1816G562R0F
A11R211	321-0140-00			RES.,FXD,FILM:280 OHM,1%,0.125W	91637	MFF1816G280R0F
A11R212	321-0227-00			RES.,FXD,FILM:2.26K OHM,1%,0.125W	91637	MFF1816G22600F
A11R213	323-0119-00			RES.,FXD,FILM:169 OHM,1%,0.50W	75042	CECT0-1690F
A11R220	321-0193-00			RES.,FXD,FILM:1K OHM,1%,0.125W	91637	MFF1816G10000F
A11R222	321-0193-00			RES.,FXD,FILM:1K OHM,1%,0.125W	91637	MFF1816G10000F
A11R232	321-0145-00			RES.,FXD,FILM:316 OHM,1%,0.125W	91637	MFF1816G316R0F
A11R233	321-0641-00			RES.,FXD,FILM:1.8K OHM,1%,0.125W	91637	MFF1816G18000F
A11R235	321-0227-00			RES.,FXD,FILM:2.26K OHM,1%,0.125W	91637	MFF1816G22600F
A11R236	321-0198-00			RES.,FXD,FILM:1.13K OHM,1%,0.125W	91637	MFF1816G11300F
A11R238	321-0169-00			RES.,FXD,FILM:562 OHM,1%,0.125W	91637	MFF1816G562R0F

A11 COLOR MAP (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A11R240	321-0140-00			RES.,FXD,FILM:280 OHM,1%,0.125W	91637	MFF1816G280R0F
A11R241	321-0227-00			RES.,FXD,FILM:2.26K OHM,1%,0.125W	91637	MFF1816G22600F
A11R242	323-0119-00			RES.,FXD,FILM:169 OHM,1%,0.50W	75042	CECT0-1690F
A11R246	321-0145-00			RES.,FXD,FILM:316 OHM,1%,0.125W	91637	MFF1816G316R0F
A11R247	321-0641-00			RES.,FXD,FILM:1.8K OHM,1%,0.125W	91637	MFF1816G18000F
A11R249	321-0227-00			RES.,FXD,FILM:2.26K OHM,1%,0.125W	91637	MFF1816G22600F
A11R251	321-0198-00			RES.,FXD,FILM:1.13K OHM,1%,0.125W	91637	MFF1816G11300F
A11R254	321-0169-00			RES.,FXD,FILM:562 OHM,1%,0.125W	91637	MFF1816G562R0F
A11R255	321-0140-00			RES.,FXD,FILM:280 OHM,1%,0.125W	91637	MFF1816G280R0F
A11R256	321-0030-00			RES.,FXD,FILM:20 OHM,1%,0.125W	91637	MFF1816G20R00F
A11R257	321-0227-00			RES.,FXD,FILM:2.26K OHM,1%,0.125W	91637	MFF1816G22600F
A11R258	323-0119-00			RES.,FXD,FILM:169 OHM,1%,0.50W	75042	CECT0-1690F
A11R259	308-0075-00			RES.,FXD,WW:100 OHM,5%,3W	91637	CW2B-100R0J
A11R402	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A11R417	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A11R437	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A11R443	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A11R465	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
A11R472	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A11R562	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A11R602	307-0650-00			RES NTWK,FXD,FI:9,2.7K OHM,5%,0.150W	32997	4310R-101-272
A11R605	307-0650-00			RES NTWK,FXD,FI:9,2.7K OHM,5%,0.150W	32997	4310R-101-272
A11R610	307-0486-00			RES,NTWK,THK FI:100 OHM,20%,1.125W	91637	MSP10A01-101J
A11R615	307-0486-00			RES,NTWK,THK FI:100 OHM,20%,1.125W	91637	MSP10A01-101J
A11R623	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A11R634	307-0486-00			RES,NTWK,THK FI:100 OHM,20%,1.125W	91637	MSP10A01-101J
A11R640	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
A11R650	307-0650-00			RES NTWK,FXD,FI:9,2.7K OHM,5%,0.150W	32997	4310R-101-272
A11R652	307-0650-00			RES NTWK,FXD,FI:9,2.7K OHM,5%,0.150W	32997	4310R-101-272
A11R655	307-0650-00			RES NTWK,FXD,FI:9,2.7K OHM,5%,0.150W	32997	4310R-101-272
A11U65	156-0277-00			MICROCIRCUIT,LI:VOLTAGE REGULATOR	07263	MICR0A7805UC
A11U165	156-0846-00			MICROCIRCUIT,LI:VOLTAGE REGULATOR	04713	MC7905CT
A11U400	156-1633-00			MICROCIRCUIT,DI:16 X 4 BIPOLAR SRAM,STTL	34335	AM27S03ADC
A11U405	156-1634-00			MICROCIRCUIT,DI:QUAD 2-INPUT 4-BIT RGTR	34335	AM25S09
A11U410	156-0368-03			MICROCIRCUIT,DI:TTL TO ECL QUAD TRANS	80009	156-0368-03
A11U415	156-0633-02			MICROCIRCUIT,DI:HEX D MAST-SLV FF,SCRN	80009	156-0633-02
A11U417	156-0323-02			MICROCIRCUIT,DI:HEX INVERTER,BURN-IN	01295	SN74S04
A11U420	156-0368-03			MICROCIRCUIT,DI:TTL TO ECL QUAD TRANS	80009	156-0368-03
A11U425	156-0633-02			MICROCIRCUIT,DI:HEX D MAST-SLV FF,SCRN	80009	156-0633-02
A11U430	156-0636-00			MICROCIRCUIT,DI:DUAL 3-INP,3-OUT NOR GATE	04713	MC10111 L OR P
A11U435	156-0368-03			MICROCIRCUIT,DI:TTL TO ECL QUAD TRANS	80009	156-0368-03
A11U440	156-1634-00			MICROCIRCUIT,DI:QUAD 2-INPUT 4-BIT RGTR	34335	AM25S09
A11U445	156-1633-00			MICROCIRCUIT,DI:16 X 4 BIPOLAR SRAM,STTL	34335	AM27S03ADC
A11U450	156-1633-00			MICROCIRCUIT,DI:16 X 4 BIPOLAR SRAM,STTL	34335	AM27S03ADC
A11U455	156-1634-00			MICROCIRCUIT,DI:QUAD 2-INPUT 4-BIT RGTR	34335	AM25S09
A11U460	156-0368-03			MICROCIRCUIT,DI:TTL TO ECL QUAD TRANS	80009	156-0368-03
A11U465	156-0633-02			MICROCIRCUIT,DI:HEX D MAST-SLV FF,SCRN	80009	156-0633-02
A11U470	156-0388-03			MICROCIRCUIT,DI:DUAL D FLIP-FLOP	07263	74LS74A
A11U505	156-0451-02			MICROCIRCUIT,DI:QUAD 2-INP NOR BFR,SCRN	01295	SN74128
A11U510	156-0316-04			MICROCIRCUIT,DI:QUAD ECL TO TTL TRANS	80009	156-0316-04
A11U515	156-0381-02			MICROCIRCUIT,DI:QUAD 2-INP EXCL OR GATE	01295	SN74LS86
A11U517	156-0118-03			MICROCIRCUIT,DI:1 DUAL J-K FF,BURN-IN	01295	SN74S112JP3
A11U520	156-0385-02			MICROCIRCUIT,DI:HEX INVERTER	01295	SN74LS04
A11U525	156-0118-03			MICROCIRCUIT,DI:1 DUAL J-K FF,BURN-IN	01295	SN74S112JP3
A11U530	156-0118-03			MICROCIRCUIT,DI:1 DUAL J-K FF,BURN-IN	01295	SN74S112JP3
A11U535	156-0323-02			MICROCIRCUIT,DI:HEX INVERTER,BURN-IN	01295	SN74S04
A11U540	156-0914-02			MICROCIRCUIT,DI:OCT ST BFR W/3 STATE OUT	01295	SN74LS240

A11 COLOR MAP (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A11U545	156-0914-02			MICROCIRCUIT,DI:OCT ST BFR W/3 STATE OUT	01295	SN74LS240
A11U550	156-0385-02			MICROCIRCUIT,DI:HEX INVERTER	01295	SN74LS04
A11U555	156-0651-02			MICROCIRCUIT,DI:8 BIT PRL-OUTSER SHF RGTR	01295	SN74LS164
A11U560	156-0480-02			MICROCIRCUIT,DI:QUAD 2 INP & GATE	01295	SN74LS08NP3
A11U565	156-0784-02			MICROCIRCUIT,DI:SYNC 4 BIT BINARY COUNTER	27014	DM74LS163ANA+
A11U570	156-0464-02			MICROCIRCUIT,DI:DUAL 4 INP NAND GATE	01295	SN74LS20
A11U620	156-0316-04			MICROCIRCUIT,DI:QUAD ECL TO TTL TRANS	80009	156-0316-04
A11U630	156-0382-02			MICROCIRCUIT,DI:QUAD 2-INP NAND GATE	01295	SN74LS00
A11U635	156-0914-02			MICROCIRCUIT,DI:OCT ST BFR W/3 STATE OUT	01295	SN74LS240
A11U640	156-0479-02			MICROCIRCUIT,DI:QUAD 2-INP ORGATE	01295	SN74LS32NP3
A11U660	156-0479-02			MICROCIRCUIT,DI:QUAD 2-INP ORGATE	01295	SN74LS32NP3
A11U665	156-0382-02			MICROCIRCUIT,DI:QUAD 2-INP NAND GATE	01295	SN74LS00
A11U670	156-0784-02			MICROCIRCUIT,DI:SYNC 4 BIT BINARY COUNTER	27014	DM74LS163ANA+

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A12	670-7587-00			CKT BOARD ASSY:DISPLAY INTERCONNECT	80009	670-7587-00
A12J360	131-2306-00			CONN,RCPT,ELEC:CKT BD,14 CONT,MALE,R ANGLE	00779	87230-7
A12J361	131-0589-00 ----- -----			TERMINAL,PIN:0.46 L X 0.025 SQ (QUANTITY OF 2)	22526	47350
A12J362	131-2817-00			CONN,RCPT,ELEC:BNC,FEM,RIGHT ANGLE	00779	227222-1
A12J363	131-2817-00			CONN,RCPT,ELEC:BNC,FEM,RIGHT ANGLE	00779	227222-1
A12J364	131-2817-00			CONN,RCPT,ELEC:BNC,FEM,RIGHT ANGLE	00779	227222-1
A12J365	131-2817-00			CONN,RCPT,ELEC:BNC,FEM,RIGHT ANGLE	00779	227222-1
A12J366	131-2817-00			CONN,RCPT,ELEC:BNC,FEM,RIGHT ANGLE	00779	227222-1
A12RV362	307-0638-00			RES,V SENSITIVE:18V,20%,0.5W	03508	MOV-V18ZA1
A12RV363	307-0638-00			RES,V SENSITIVE:18V,20%,0.5W	03508	MOV-V18ZA1
A12RV364	307-0638-00			RES,V SENSITIVE:18V,20%,0.5W	03508	MOV-V18ZA1
A12RV365	307-0638-00			RES,V SENSITIVE:18V,20%,0.5W	03508	MOV-V18ZA1
A12RV366	307-0638-00			RES,V SENSITIVE:18V,20%,0.5W	03508	MOV-V18ZA1

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A13	620-0294-01			POWER SUPPLY:	80009	620-0294-01
A13C435	283-0008-00			CAP.,FXD,CER DI:0.1UF,20%,500V	56289	275C8
A13C1001	283-0167-00			CAP.,FXD,CER DI:0.1UF,10%,100V	72982	8131N145X5R0104K
A13C1004	283-0167-00			CAP.,FXD,CER DI:0.1UF,10%,100V	72982	8131N145X5R0104K
A13CR1001	152-0721-00			SEMICOND DEVICE:RECT,SI,100V,12A,FAST REC	25403	BYW30-100U
A13CR1002	152-0714-00			SEMICOND DEVICE:RECT,SI,SCHOTTKY,40V,50A	01281	1N6098
A13CR1003	152-0714-00			SEMICOND DEVICE:RECT,SI,SCHOTTKY,40V,50A	01281	1N6098
A13CR1004	152-0721-00			SEMICOND DEVICE:RECT,SI,100V,12A,FAST REC	25403	BYW30-100U
A13E1002	276-0635-01			CORE,EM:TOROID,FERRITE	56880	EJ41405-TC
A13F3001	159-0201-00			FUSE,CARTRIDGE:3AG,10A,125V,5 SEC	71400	GLH-10
A13FL1001	119-1348-00			FILTER,RFI:10A,115/250V	13050	605C10
A13FL1002	119-1168-00			CAPACITOR-RES:0.1UF,20% & 22 OHM,10%,250V	14752	RG1782-1
A13J3001	131-1084-00			CONNECTOR,RCPT,:3 BLADE,6A,250V	82389	EAC-302
A13J3002	131-1234-00			CONN,RCPT,ELEC:PWR,FEMALE,250VAC,6A	82389	EAC-305
A13L1001	108-1069-00			COIL,RF:FIXED,20UH	80009	108-1069-00
A13Q710	151-0679-00			TRANSISTOR:SILICON,NPN	04713	SJE362
A13Q720	151-0679-00			TRANSISTOR:SILICON,NPN	04713	SJE362
A13Q741	151-0657-00			TRANSISTOR:SILICON,PNP	04713	SJE1973
A13Q751	151-0656-00			TRANSISTOR:SILICON,NPN	04713	SJE1972
A13Q761	151-0528-00			TRANSISTOR:SILICON,50V,16A	04713	2N6400
A13Q771	151-0657-00			TRANSISTOR:SILICON,PNP	04713	SJE1973
A13Q785	151-0656-00			TRANSISTOR:SILICON,NPN	04713	SJE1972
A13Q795	151-0477-00			TRANSISTOR:SILICON,NPN	04713	SJE374
A13R1001	307-0004-00			RES.,FXD,CMPSN:3.9 OHM,5%,1W	23223	C10L-120000K
A13R1004	307-0004-00			RES.,FXD,CMPSN:3.9 OHM,5%,1W	23223	C10L-120000K

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A13A1	670-6503-03			CKT BOARD ASSY:INVERTER	80009	670-6503-03
A13A1C105	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	56289	273C5
A13A1C135	283-0067-00			CAP.,FXD,CER DI:0.001UF,10%,200V	56289	19C607
A13A1C137	283-0060-00			CAP.,FXD,CER DI:100PF,5%,200V	72982	855-535U2J101J
A13A1C145	290-0829-00			CAP.,FXD,ELCTLT:750UF,+100-10%,200V	90201	PFP751SR2J3P2
A13A1C160	290-0829-00			CAP.,FXD,ELCTLT:750UF,+100-10%,200V	90201	PFP751SR2J3P2
A13A1C174	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13A1C175	290-0817-00			CAP.,FXD,ELCTLT:100UF,+50-10%,63V	55680	NCA63ELB100-T
A13A1C249	283-0057-00			CAP.,FXD,CER DI:0.1UF,+80-20%,200V	56289	2C20Z5U104Z200B
A13A1C276	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	56289	273C5
A13A1C345	290-0829-00			CAP.,FXD,ELCTLT:750UF,+100-10%,200V	90201	PFP751SR2J3P2
A13A1C360	290-0829-00			CAP.,FXD,ELCTLT:750UF,+100-10%,200V	90201	PFP751SR2J3P2
A13A1C471	285-1133-00			CAP.,FXD,PLSTC:0.33UF,1%,100V	50558	MH12D334F
A13A1C473	283-0134-00			CAP.,FXD,CER DI:0.47UF,+80-20%,50V	72982	8131N087Z5U0474Z
A13A1C501	285-1203-00			CAP.,FXD,PLSTC:4UF,10%,200V	14952	C2551
A13A1C520	285-1203-00			CAP.,FXD,PLSTC:4UF,10%,200V	14952	C2551
A13A1C545	290-0829-00			CAP.,FXD,ELCTLT:750UF,+100-10%,200V	90201	PFP751SR2J3P2
A13A1C560	290-0829-00			CAP.,FXD,ELCTLT:750UF,+100-10%,200V	90201	PFP751SR2J3P2
A13A1C577	283-0067-00			CAP.,FXD,CER DI:0.001UF,10%,200V	56289	19C607
A13A1C581	283-0190-00			CAP.,FXD,CER DI:0.47UF,5%,50V	72982	8141N077X7R0474J
A13A1C609	283-0659-00			CAP.,FXD,MICA D:1160PF,2%,500V	00853	D195C1161G0
A13A1C629	283-0057-00			CAP.,FXD,CER DI:0.1UF,+80-20%,200V	56289	2C20Z5U104Z200B
A13A1C630	283-0057-00			CAP.,FXD,CER DI:0.1UF,+80-20%,200V	56289	2C20Z5U104Z200B
A13A1C631	283-0194-00			CAP.,FXD,CER DI:4.7UF,20%,50V	72982	8151N057Z5U0475M
A13A1C643	285-1192-00			CAP.,FXD,PPR DI:0.0022UF,20%,250VAC	000FG	PME271Y422
A13A1C669	283-0328-00			CAP.,FXD,CER DI:0.03UF,+80-20%,200V	72982	8131N225Z5U0303Z
A13A1C673	283-0116-00			CAP.,FXD,CER DI:820PF,5%,500V	72982	801-547B821J
A13A1C733	283-0194-00			CAP.,FXD,CER DI:4.7UF,20%,50V	72982	8151N057Z5U0475M
A13A1C773	285-0598-00			CAP.,FXD,PLSTC:0.01UF,5%,100V	01002	61F10AC103
A13A1C780	283-0067-00			CAP.,FXD,CER DI:0.001UF,10%,200V	56289	19C607
A13A1C785	283-0422-00			CAP.,FXD,CER DI:0.047UF,+80-20%,50V	04222	DG015E473Z
A13A1CR106	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13A1CR107	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13A1CR108	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13A1CR109	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13A1CR125	152-0333-00			SEMICOND DEVICE:SILICON,55V,200MA	07263	FDH-6012
A13A1CR126	152-0333-00			SEMICOND DEVICE:SILICON,55V,200MA	07263	FDH-6012
A13A1CR127	152-0333-00			SEMICOND DEVICE:SILICON,55V,200MA	07263	FDH-6012
A13A1CR128	152-0333-00			SEMICOND DEVICE:SILICON,55V,200MA	07263	FDH-6012
A13A1CR180	152-0333-00			SEMICOND DEVICE:SILICON,55V,200MA	07263	FDH-6012
A13A1CR181	152-0333-00			SEMICOND DEVICE:SILICON,55V,200MA	07263	FDH-6012
A13A1CR227	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13A1CR325	152-0713-00			SEMICOND DEVICE:RECT BRIDGE,SI,400V,35A	04713	SDA10388K
A13A1CR471	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13A1CR477	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13A1CR478	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13A1CR615	152-0400-00			SEMICOND DEVICE:SILICON,400V,1A	80009	152-0400-00
A13A1CR629	152-0400-00			SEMICOND DEVICE:SILICON,400V,1A	80009	152-0400-00
A13A1CR630	152-0400-00			SEMICOND DEVICE:SILICON,400V,1A	80009	152-0400-00
A13A1CR661	152-0071-00			SEMICOND DEVICE:GERMANIUM,15V,40MA	15238	G865
A13A1CR663	152-0071-00			SEMICOND DEVICE:GERMANIUM,15V,40MA	15238	G865
A13A1CR671	152-0071-00			SEMICOND DEVICE:GERMANIUM,15V,40MA	15238	G865
A13A1CR701	152-0400-00			SEMICOND DEVICE:SILICON,400V,1A	80009	152-0400-00
A13A1CR729	152-0400-00			SEMICOND DEVICE:SILICON,400V,1A	80009	152-0400-00
A13A1CR733	152-0400-00			SEMICOND DEVICE:SILICON,400V,1A	80009	152-0400-00
A13A1CR751	152-0242-00			SEMICOND DEVICE:SILICON,225V,200MA	07263	FDH5004
A13A1CR753	152-0242-00			SEMICOND DEVICE:SILICON,225V,200MA	07263	FDH5004

A13A1 INVERTER (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A13A1CR781	152-0071-00			SEMICOND DEVICE:GERMANIUM,15V,40MA	15238	G865
A13A1DS249	150-0035-00			LAMP,GLOW:90V,0.3MA	53944	A1B-3
A13A1E237	119-0181-00			ARSR,ELEC SURGE:230V,GAS FILLED	74276	CG230L
A13A1E431	119-0181-00			ARSR,ELEC SURGE:230V,GAS FILLED	74276	CG230L
A13A1E435	119-0285-00			ARSR,ELEC SURGE:470VDC,+/-15%	74276	CG470L
A13A1J61	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ	22526	47350
	----- -----			(QUANTITY OF 6)		
A13A1J62	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ	22526	47350
	----- -----			(QUANTITY OF 6)		
A13A1J63	131-0589-00			TERMINAL,PIN:0.46 L X 0.025 SQ	22526	47350
	----- -----			(QUANTITY OF 7)		
A13A1J64	131-1425-00			CONTACT SET,ELE:R ANGLE,0.150" L,STR OF 36	22526	65521-136
A13A1J65	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 10)		
A13A1J67	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 2)		
A13A1J68	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 2)		
A13A1J69	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 2)		
A13A1Q138	151-0342-00			TRANSISTOR:SILICON,PNP	07263	S035928
A13A1Q139	151-0432-00			TRANSISTOR:SILICON,NPN	80009	151-0432-00
A13A1Q205	151-0537-00			THYRISTOR:TRIAC,10A,400V	03508	SC146DX176
A13A1Q271	151-0432-00			TRANSISTOR:SILICON,NPN	80009	151-0432-00
A13A1Q273	151-0435-00			TRANSISTOR:SILICON,PNP	04713	SPS8335
A13A1Q275	151-0432-00			TRANSISTOR:SILICON,NPN	80009	151-0432-00
A13A1Q276	151-0482-00			TRANSISTOR:SILICON,PNP	80009	151-0482-00
A13A1Q575	151-0342-00			TRANSISTOR:SILICON,PNP	07263	S035928
A13A1Q663	151-0439-00			TRANSISTOR:SILICON,NPN	80009	151-0439-00
A13A1Q673	151-0342-00			TRANSISTOR:SILICON,PNP	07263	S035928
A13A1Q685	151-0136-00			TRANSISTOR:SILICON,NPN	02735	35495
A13A1Q751	151-0323-00			TRANSISTOR:SILICON,NPN,SEL FROM MJE521	04713	SJE916
A13A1Q759	151-0439-00			TRANSISTOR:SILICON,NPN	80009	151-0439-00
A13A1R103	308-0336-00			RES.,FXD,WW:7K OHM,5%,5W	12697	OBD
A13A1R104	308-0237-00			RES.,FXD,WW:8.2K OHM,5%,5W	14193	SA50
A13A1R108	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13A1R113	315-0331-00			RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
A13A1R125	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
A13A1R126	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
A13A1R127	315-0622-00			RES.,FXD,CMPSN:6.2K OHM,5%,0.25W	01121	CB6225
A13A1R151	305-0333-00			RES.,FXD,CMPSN:33K OHM,5%,2W	01121	HB3335
A13A1R175	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
A13A1R177	315-0914-00			RES.,FXD,CMPSN:910K OHM,5%,0.25W	01121	CB9145
A13A1R178	321-0443-00			RES.,FXD,FILM:402K OHM,1%,0.125W	91637	MFF1816G40202F
A13A1R179	315-0274-00			RES.,FXD,CMPSN:270K OHM,5%,0.25W	01121	CB2745
A13A1R180	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A13A1R221	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
A13A1R249	301-0565-00			RES.,FXD,CMPSN:5.6M OHM,5%,0.50W	01121	EB5655
A13A1R260	305-0333-00			RES.,FXD,CMPSN:33K OHM,5%,2W	01121	HB3335
A13A1R275	321-0463-00			RES.,FXD,FILM:649K OHM,1%,0.125W	91637	MFF1816G64902F
A13A1R276	321-0423-00			RES.,FXD,FILM:249K OHM,1%,0.125W	91637	MFF1816G24902F
A13A1R277	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A13A1R281	315-0220-00			RES.,FXD,CMPSN:22 OHM,5%,0.25W	01121	CB2205
A13A1R283	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A13A1R371	321-0510-00			RES.,FXD,FILM:2M OHM,1%,0.125W	91637	HFF188G20003F
A13A1R373	321-0431-00			RES.,FXD,FILM:301K OHM,1%,0.125W	91637	MFF1816G30102F
A13A1R375	321-0227-00			RES.,FXD,FILM:2.26K OHM,1%,0.125W	91637	MFF1816G22600F

A13A1 INVERTER (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A13A1R376	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
A13A1R383	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A13A1R384	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A13A1R471	315-0432-00			RES.,FXD,CMPSN:4.3K OHM,5%,0.25W	01121	CB4325
A13A1R472	315-0393-00			RES.,FXD,CMPSN:39K OHM,5%,0.25W	01121	CB3935
A13A1R473	315-0204-00			RES.,FXD,CMPSN:200K OHM,5%,0.25W	01121	CB2045
A13A1R474	315-0394-00			RES.,FXD,CMPSN:390K OHM,5%,0.25W	01121	CB3945
A13A1R475	315-0564-00			RES.,FXD,CMPSN:560K OHM,5%,0.25W	01121	CB5645
A13A1R477	321-0359-00			RES.,FXD,FILM:53.6K OHM,1%,0.125W	91637	MFF1816G53601F
A13A1R478	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
A13A1R479	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
A13A1R510	308-0079-00			RES.,FXD,WW:117 OHM,5%,5W	91637	RS5-K117R0J
A13A1R570	315-0821-00			RES.,FXD,CMPSN:820 OHM,5%,0.25W	01121	CB8215
A13A1R571	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
A13A1R573	321-0223-00			RES.,FXD,FILM:2.05K OHM,1%,0.125W	91637	MFF1816G20500F
A13A1R574	321-0202-00			RES.,FXD,FILM:1.24K OHM,1%,0.125W	91637	MFF1816G12400F
A13A1R575	321-0202-00			RES.,FXD,FILM:1.24K OHM,1%,0.125W	91637	MFF1816G12400F
A13A1R576	321-0246-00			RES.,FXD,FILM:3.57K OHM,1%,0.125W	91637	MFF1816G35700F
A13A1R577	321-0222-00			RES.,FXD,FILM:2K OHM,1%,0.125W	91637	MFF1816G20000F
A13A1R581	315-0220-00			RES.,FXD,CMPSN:22 OHM,5%,0.25W	01121	CB2205
A13A1R583	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A13A1R585	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A13A1R587	315-0823-00			RES.,FXD,CMPSN:82K OHM,5%,0.25W	01121	CB8235
A13A1R589	321-0193-00			RES.,FXD,FILM:1K OHM,1%,0.125W	91637	MFF1816G10000F
A13A1R630	307-0106-00			RES.,FXD,CMPSN:4.7 OHM,5%,0.25W	01121	CB47G5
A13A1R631	308-0755-00			RES.,FXD,WW:0.75 OHM,5%,2W	75042	BWH-R7500J
A13A1R633	308-0441-00			RES.,FXD,WW:3 OHM,5%,3W	91637	CW2B-3R00J
A13A1R653	306-0331-00			RES.,FXD,CMPSN:330 OHM,10%,2W	01121	HB3311
A13A1R674	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
A13A1R675	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
A13A1R679	321-0233-00			RES.,FXD,FILM:2.61K OHM,1%,0.125W	91637	MFF1816G26100F
A13A1R683	321-0193-00			RES.,FXD,FILM:1K OHM,1%,0.125W	91637	MFF1816G10000F
A13A1R684	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
A13A1R685	311-1307-00			RES.,VAR,NONWIR:500 OHM,0.50W	32997	3299W-R27-501
A13A1R686	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
A13A1R729	307-0106-00			RES.,FXD,CMPSN:4.7 OHM,5%,0.25W	01121	CB47G5
A13A1R731	308-0441-00			RES.,FXD,WW:3 OHM,5%,3W	91637	CW2B-3R00J
A13A1R732	308-0755-00			RES.,FXD,WW:0.75 OHM,5%,2W	75042	BWH-R7500J
A13A1R751	307-0009-00			RES.,FXD,CMPSN:4.7 OHM,10%,2W	01121	GB47G1
A13A1R753	307-0009-00			RES.,FXD,CMPSN:4.7 OHM,10%,2W	01121	GB47G1
A13A1R759	303-0122-00			RES.,FXD,CMPSN:1.2K OHM,5%,1W	01121	GB1225
A13A1R763	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A13A1R765	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A13A1R783	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
A13A1R785	308-0497-00			RES.,FXD,WW:105 OHM,1%,2.5W	91637	RS2B-A105R0F
A13A1RT331	307-0350-00			RES.,THERMAL:7.5 OHM,10%,3.9%/DEG C	15454	75DJ7R5R0220SS
A13A1RT533	307-0350-00			RES.,THERMAL:7.5 OHM,10%,3.9%/DEG C	15454	75DJ7R5R0220SS
A13A1T120	120-1354-00			XFMR,PWR,STPDN:TRIGGER,LF	80009	120-1354-00
A13A1T529	120-1352-00			TRANSFORMER,RF:TOROID	80009	120-1352-00
A13A1T645	120-1353-00			TRANSFORMER,RF:TOROID	80009	120-1353-00
A13A1T741	120-1119-01			TRANSFORMER,RF:BASE DRIVE	80009	120-1119-01
A13A1TP581	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
A13A1TP781	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
A13A1TP785	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
A13A1U277	156-0341-02			MICROCIRCUIT,DI:DUAL 2-INP DRIVER,SCRN	01295	SN75453
A13A1U377	156-0094-01			MICROCIRCUIT,DI:DUAL 2-INP NAND DRVR,CHK	80009	156-0094-01
A13A1U379	156-0158-07			MICROCIRCUIT,LI:DUAL OPNL AMPL,SCREENED	01295	MC1458JG4

A13A1 INVERTER (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A13A1U479	156-1226-00			MICROCIRCUIT,LI:DUAL COMPARATOR,14 DIP	80009	156-1226-00
A13A1U677	156-0933-01			MICROCIRCUIT,LI:RGLTR,PULSE WIDTH MOD,SCRN	34333	SG9976
A13A1VR176	153-0058-00			SEMICOND DVC,SE:ZENER,SEL,6.2V,5%,10MA	80009	153-0058-00

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A13A2	670-6502-00			CKT BOARD ASSY:REGULATOR	80009	670-6502-00
A13A2C105	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13A2C106	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13A2C111	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	91418	SP103Z151-4R9
A13A2C113	283-0067-00			CAP.,FXD,CER DI:0.001UF,10%,200V	56289	19C607
A13A2C131	290-0770-00			CAP.,FXD,ELCTLT:100UF,+50-10%,25V	56289	502D230
A13A2C141	290-0770-00			CAP.,FXD,ELCTLT:100UF,+50-10%,25V	56289	502D230
A13A2C151	283-0057-00			CAP.,FXD,CER DI:0.1UF,+80-20%,200V	56289	2C20Z5U104Z200B
A13A2C154	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	91418	SP103Z151-4R9
A13A2C163	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13A2C175	283-0067-00			CAP.,FXD,CER DI:0.001UF,10%,200V	56289	19C607
A13A2C183	283-0067-00			CAP.,FXD,CER DI:0.001UF,10%,200V	56289	19C607
A13A2C184	283-0067-00			CAP.,FXD,CER DI:0.001UF,10%,200V	56289	19C607
A13A2C190	283-0178-00			CAP.,FXD,CER DI:0.1UF,+80-20%,100V	72982	8131N145651 104Z
A13A2C255	283-0177-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	56289	273C5
A13A2C261	290-0798-00			CAP.,FXD,ELCTLT:180UF,+100-10%,40V	56289	672D187H040DM5C
A13A2C293	283-0178-00			CAP.,FXD,CER DI:0.1UF,+80-20%,100V	72982	8131N145651 104Z
A13A2C331	283-0057-00			CAP.,FXD,CER DI:0.1UF,+80-20%,200V	56289	2C20Z5U104Z200B
A13A2C383	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13A2C392	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13A2C423	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	91418	SP103Z151-4R9
A13A2C433	283-0028-00			CAP.,FXD,CER DI:0.0022UF,20%,50V	56289	19C606
A13A2C451	283-0028-00			CAP.,FXD,CER DI:0.0022UF,20%,50V	56289	19C606
A13A2C461	290-0798-00			CAP.,FXD,ELCTLT:180UF,+100-10%,40V	56289	672D187H040DM5C
A13A2C521	290-0798-00			CAP.,FXD,ELCTLT:180UF,+100-10%,40V	56289	672D187H040DM5C
A13A2C533	283-0028-00			CAP.,FXD,CER DI:0.0022UF,20%,50V	56289	19C606
A13A2C553	283-0028-00			CAP.,FXD,CER DI:0.0022UF,20%,50V	56289	19C606
A13A2C563	290-0773-00			CAP.,FXD,ELCTLT:1000UF,+50-10%,10V	0000L	ECE-B10Z1000
A13A2C581	290-0751-00			CAP.,FXD,ELCTLT:2200UF,+50-10%,16V	56289	D76245
A13A2C585	290-0800-00			CAP.,FXD,ELCTLT:250UF,+100-10%,20V	56289	672D257H0200M5C
A13A2C621	290-0816-00			CAP.,FXD,ELCTLT:400UF,+75-10%,50V	56289	39D985
A13A2C671	283-0057-00			CAP.,FXD,CER DI:0.1UF,+80-20%,200V	56289	2C20Z5U104Z200B
A13A2C720	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13A2C789	290-0751-00			CAP.,FXD,ELCTLT:2200UF,+50-10%,16V	56289	D76245
A13A2C796	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	72982	8005D9AABZ5U104M
A13A2CR123	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A13A2CR124	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A13A2CR141	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13A2CR171	152-0661-00			SEMICOND DEVICE:RECT,SI,600V,3A,FAST	04713	MR856
A13A2CR172	152-0661-00			SEMICOND DEVICE:RECT,SI,600V,3A,FAST	04713	MR856
A13A2CR173	152-0784-00			SEMICOND DEVICE:RECT,SI,FAST RCVY,200V,5.0	04713	SR3688
A13A2CR181	152-0661-00			SEMICOND DEVICE:RECT,SI,600V,3A,FAST	04713	MR856
A13A2CR182	152-0661-00			SEMICOND DEVICE:RECT,SI,600V,3A,FAST	04713	MR856
A13A2CR231	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A13A2CR236	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13A2CR237	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13A2CR238	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13A2CR271	152-0784-00			SEMICOND DEVICE:RECT,SI,FAST RCVY,200V,5.0	04713	SR3688
A13A2CR341	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13A2CR519	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A13A2CR591	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	14433	LG4016
A13A2CR641	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13A2CR642	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	01295	1N4152R
A13A2J82	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 10)		
A13A2J83	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 3)		

A13A2 REGULATOR (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A13A2J84	131-2250-00			CONN,RCPT,ELEC:CKT BD,5 MALE	27264	09-61-1053
A13A2J85	131-0608-00			TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
	----- -----			(QUANTITY OF 16)		
A13A2L215	108-0317-00			COIL,RF:FIXED,15UH	32159	71501M
A13A2L261	108-1017-00			COIL,RF:FXD,1MH	80009	108-1017-00
A13A2L291	108-1068-00			COIL,RF:FIXED,700UH	80009	108-1068-00
A13A2L361	108-0860-00			COIL,RF:FIXED,605UH	80009	108-0860-00
A13A2L391	108-1067-00			COIL,RF:FIXED,52MH	80009	108-1067-00
A13A2L565	108-0935-00			COIL,RF:FIXED,2.4UH	80009	108-0935-00
A13A2Q115	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A13A2Q251	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A13A2Q252	151-1005-00			TRANSISTOR:SILICON,JFE,N-CHANNEL	80009	151-1005-00
A13A2Q253	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A13A2Q254	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A13A2Q344	151-1005-00			TRANSISTOR:SILICON,JFE,N-CHANNEL	80009	151-1005-00
A13A2Q441	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A13A2Q442	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A13A2Q443	151-0192-00			TRANSISTOR:SILICON,NPN,SEL FROM MPS6521	04713	SPS8801
A13A2Q541	151-0192-00			TRANSISTOR:SILICON,NPN,SEL FROM MPS6521	04713	SPS8801
A13A2Q631	151-0350-00			TRANSISTOR:SILICON,PNP	04713	SPS6700
A13A2Q632	151-0350-00			TRANSISTOR:SILICON,PNP	04713	SPS6700
A13A2Q633	151-0350-00			TRANSISTOR:SILICON,PNP	04713	SPS6700
A13A2Q651	151-1005-00			TRANSISTOR:SILICON,JFE,N-CHANNEL	80009	151-1005-00
A13A2Q655	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A13A2Q731	151-0432-00			TRANSISTOR:SILICON,NPN	80009	151-0432-00
A13A2Q775	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
A13A2Q781	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
A13A2R112	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
A13A2R114	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
A13A2R116	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
A13A2R121	301-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.50W	01121	EB1525
A13A2R122	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
A13A2R124	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A13A2R125	308-0590-00			RES.,FXD,WW:0.25 OHM,5%,3W	91637	RS2B-ER2500J
A13A2R143	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A13A2R144	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
A13A2R152	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
A13A2R153	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A13A2R155	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
A13A2R185	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A13A2R186	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A13A2R190	307-0004-00			RES.,FXD,CMPSN:3.9 OHM,5%,1W	23223	C10L-120000K
A13A2R216	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A13A2R234	321-1296-03			RES.,FXD,FILM:12K OHM,0.25%,0.125W	91637	MFF1816D12001C
A13A2R235	315-0362-00			RES.,FXD,CMPSN:3.6K OHM,5%,0.25W	01121	CB3625
A13A2R240	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A13A2R241	321-1609-03			RES.,FXD,FILM:2.02K OHM,0.25%,0.125W	24546	NC55C2021C
A13A2R242	321-0177-00			RES.,FXD,FILM:681 OHM,1%,0.125W	91637	MFF1816G681R0F
A13A2R243	321-1296-03			RES.,FXD,FILM:12K OHM,0.25%,0.125W	91637	MFF1816D12001C
A13A2R244	321-0240-01			RES.,FXD,FILM:3.09K OHM,0.5%,0.125W	91637	MFF1816G30900D
A13A2R245	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
A13A2R253	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
A13A2R293	307-0004-00			RES.,FXD,CMPSN:3.9 OHM,5%,1W	23223	C10L-120000K
A13A2R310	303-0751-00			RES.,FXD,CMPSN:750 OHM,5%,1W	01121	GB7515
A13A2R332	321-0326-00			RES.,FXD,FILM:24.3K OHM,1%,0.125W	91637	MFF1816G24301F
A13A2R334	321-1701-04			RES.,FXD,FILM:5.22K OHM,0.1%,0.125W	91637	MFF1816D52200B
A13A2R335	321-1296-03			RES.,FXD,FILM:12K OHM,0.25%,0.125W	91637	MFF1816D12001C

A13A2 REGULATOR (CONT)

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A13A2R342	315-0272-00			RES.,FXD,CMPSN:2.7K OHM,5%,0.25W	01121	CB2725
A13A2R343	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
A13A2R351	321-1296-03			RES.,FXD,FILM:12K OHM,0.25%,0.125W	91637	MFF1816D12001C
A13A2R352	321-0159-00			RES.,FXD,FILM:442 OHM,1%,0.125W	91637	MFF1816G442R0F
A13A2R353	321-1701-04			RES.,FXD,FILM:5.22K OHM,0.1%,0.125W	91637	MFF1816D52200B
A13A2R355	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
A13A2R382	301-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.50W	01121	EB1025
A13A2R418	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A13A2R421	321-1701-04			RES.,FXD,FILM:5.22K OHM,0.1%,0.125W	91637	MFF1816D52200B
A13A2R422	321-1296-03			RES.,FXD,FILM:12K OHM,0.25%,0.125W	91637	MFF1816D12001C
A13A2R431	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
A13A2R432	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
A13A2R451	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
A13A2R518	315-0301-00			RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
A13A2R531	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
A13A2R532	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
A13A2R535	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
A13A2R545	308-0075-00			RES.,FXD,WW:100 OHM,5%,3W	91637	CW2B-100R0J
A13A2R546	321-0325-00			RES.,FXD,FILM:23.7K OHM,1%,0.125W	91637	MFF1816G23701F
A13A2R547	321-0159-00			RES.,FXD,FILM:442 OHM,1%,0.125W	91637	MFF1816G442R0F
A13A2R548	315-0273-00			RES.,FXD,CMPSN:27K OHM,5%,0.25W	01121	CB2735
A13A2R551	315-0752-00			RES.,FXD,CMPSN:7.5K OHM,5%,0.25W	01121	CB7525
A13A2R552	315-0752-00			RES.,FXD,CMPSN:7.5K OHM,5%,0.25W	01121	CB7525
A13A2R554	321-0151-00			RES.,FXD,FILM:365 OHM,1%,0.125W	91637	MFF1816G365R0F
A13A2R555	321-0816-03			RES.,FXD,FILM:5K OHM,0.25%,0.125W	91637	MFF1816D50000C
A13A2R557	315-0510-00			RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
A13A2R583	308-0701-00			RES.,FXD,WW:0.12 OHM,5%,2W	75042	BWH-R1200J
A13A2R619	308-0568-00			RES.,FXD,WW:35 OHM,5%,5W	91637	RS5-K35R00J
A13A2R621	308-0643-00			RES.,FXD,WW:0.1 OHM,3%,3W	91637	RS2B-ER1000H
A13A2R643	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
A13A2R661	303-0510-00			RES.,FXD,CMPSN:51 OHM,5%,1W	01121	GB5105
A13A2R665	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
A13A2R693	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
A13A2R695	308-0757-00			RES.,FXD,WW:0.025 OHM,3%,5W	91637	LVR5-GR0250H
A13A2R732	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
A13A2R756	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
A13A2R762	308-0643-00			RES.,FXD,WW:0.1 OHM,3%,3W	91637	RS2B-ER1000H
A13A2R793	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
A13A2R795	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A13A2T190	120-1355-00			XFMR,PWR,STPDN:HF CONVERTER	80009	120-1355-00
A13A2U431	156-0158-07			MICROCIRCUIT,LI:DUAL OPNL AMPL,SCREENED	01295	MC1458JG4
A13A2U451	156-0158-07			MICROCIRCUIT,LI:DUAL OPNL AMPL,SCREENED	01295	MC1458JG4
A13A2VR142	152-0508-00			SEMICOND DEVICE:ZENER,0.4W,12.6V,5%	80009	152-0508-00
A13A2VR212	152-0395-00			SEMICOND DEVICE:ZENER,0.4W,4.3V,5%	14552	TD332317
A13A2VR213	152-0175-00			SEMICOND DEVICE:ZENER,0.4W,5.6V,5%	04713	SZG35008
A13A2VR555	152-0395-00			SEMICOND DEVICE:ZENER,0.4W,4.3V,5%	14552	TD332317

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A14	670-5291-XX			CKT BOARD ASSY:EXTENDER		
	----- -----			(NOT AVAILABLE, USE 067-1005-00)		
A14J611	131-1346-00			CONNECTOR,RCPT,:40/80 DOUBLE ROW	05574	000201-5440
A14J612	131-1606-01			CONNECTOR,RCPT,:W/22-44 CONTACTS	80009	131-1606-01
A14TP1	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
THRU						
A14TP80	214-0579-00			TERM,TEST POINT:BRS CD PL	80009	214-0579-00
	----- -----			(ALL TEST POINTS ARE THS SAME)		

Component No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
				PEDESTAL CHASSIS PARTS		
A9001	263-0073-03			SWITCH,ROTARY:OPTICAL,CURSOR	80009	263-0073-03
A9002	263-0073-03			SWITCH,ROTARY:OPTICAL,CURSOR	80009	263-0073-03
B1001	119-0721-00			FAN,VENTILATING:75 CFM,7W,115VAC,50/60HZ	82877	027119
B1002	119-0721-00			FAN,VENTILATING:75 CFM,7W,115VAC,50/60HZ	82877	027119
LS1001	119-0962-00			LOUDSPEAKER,PM:8 OHM,3W,2.047 DIA	54473	EAS-5PH04SC
S3001	260-2058-00			SWITCH,PUSH:DPDT,1A,25VDC	31918	601003
S3002	260-1970-00			SWITCH,PUSH:0.4VA,20V MAXIMUM	09353	8125J81E
S3003	260-1970-00			SWITCH,PUSH:0.4VA,20V MAXIMUM	09353	8125J81E

Section 4

INTERCONNECT AND BLOCK DIAGRAMS

The following is a list of interconnect and block diagrams for the 4113.

INTERCONNECT DIAGRAMS

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Vector Generator Board.....4-17
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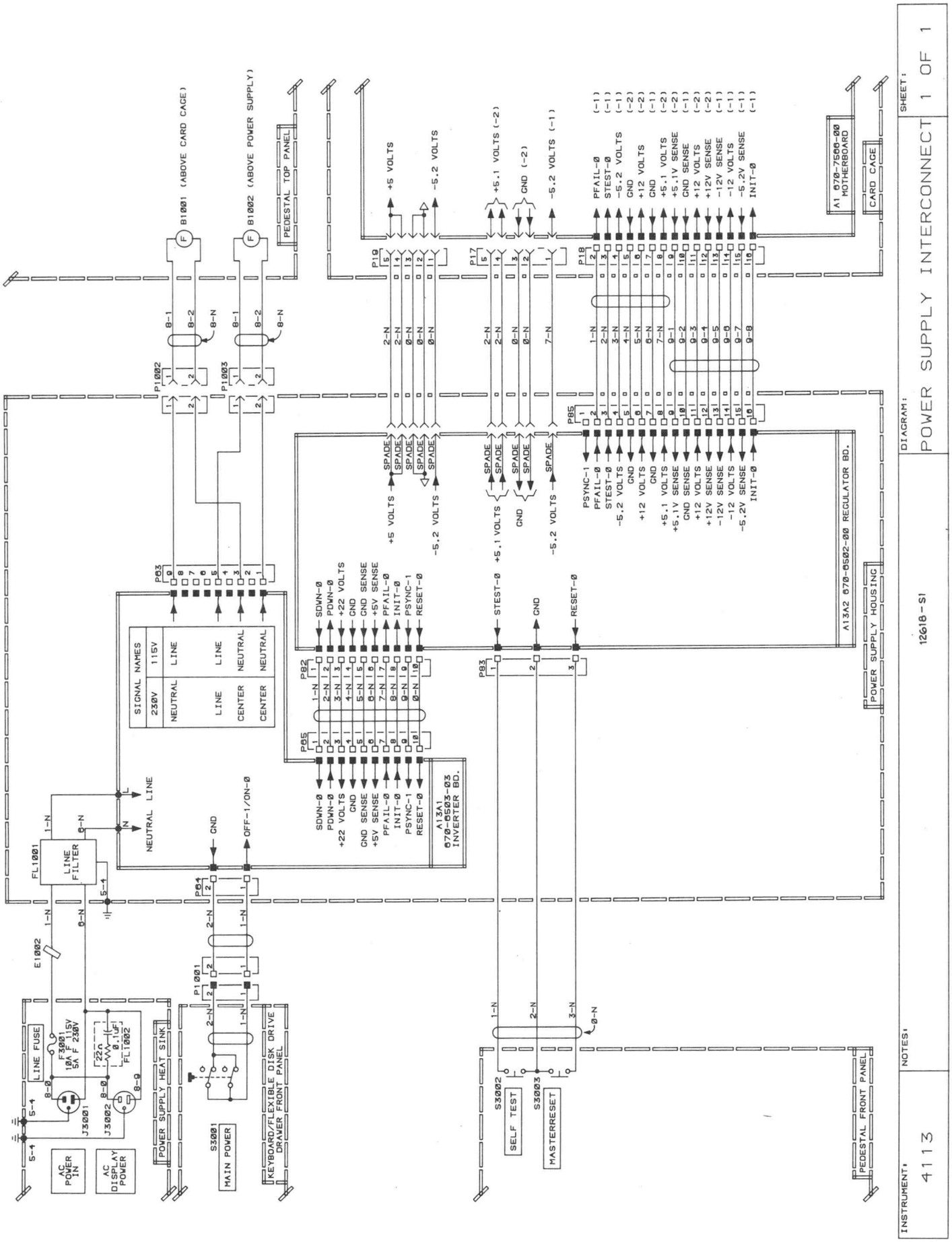
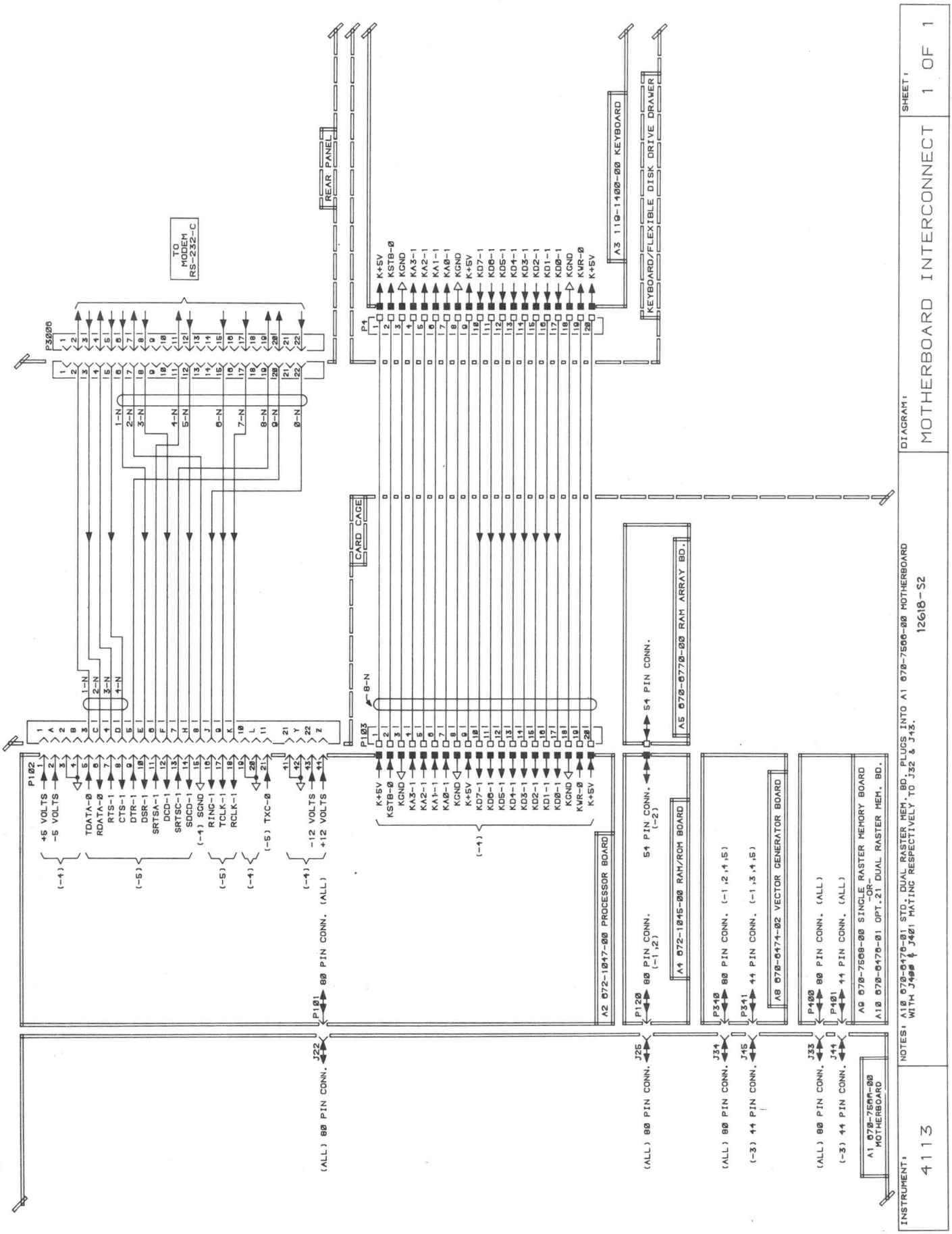
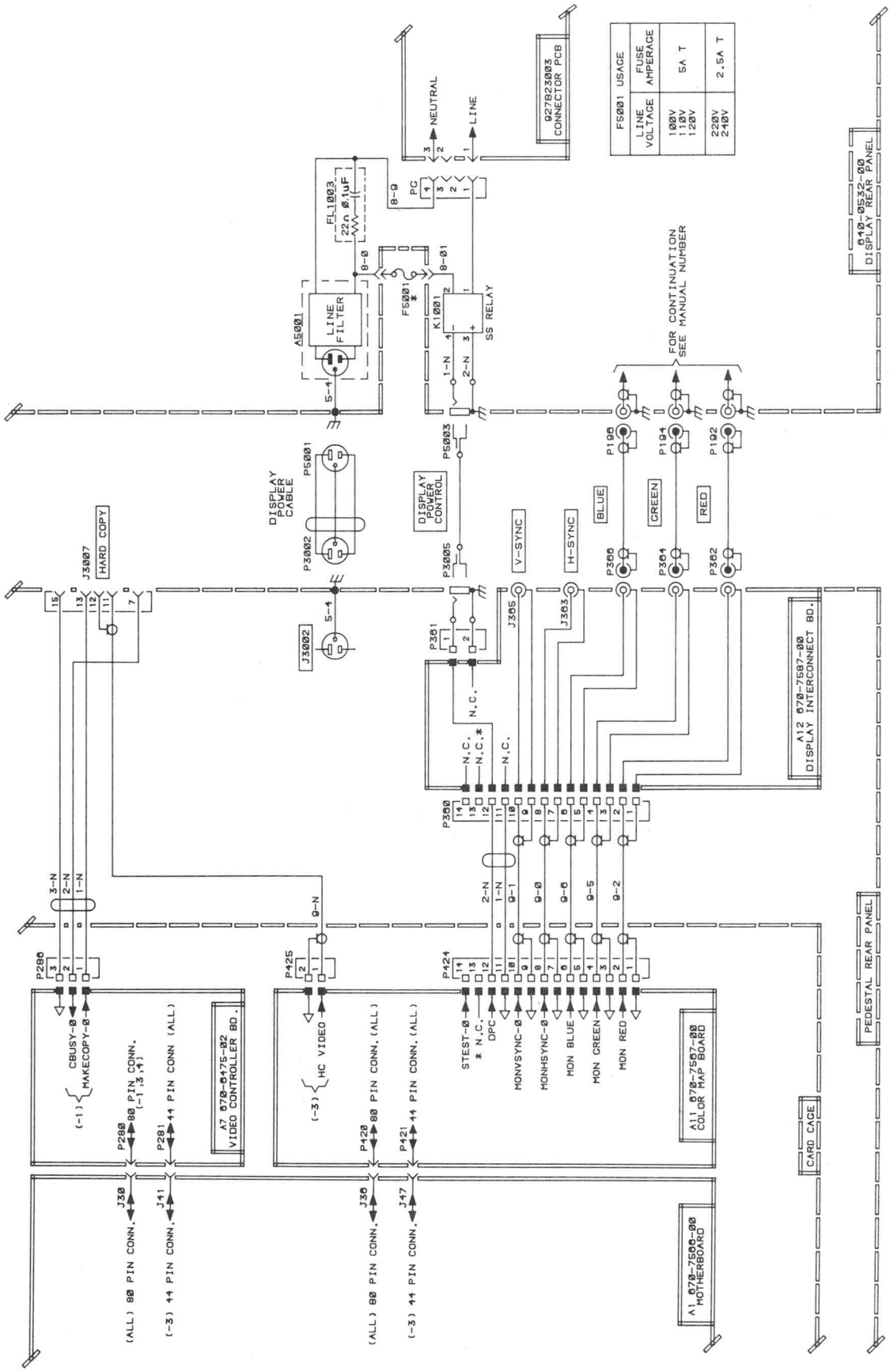
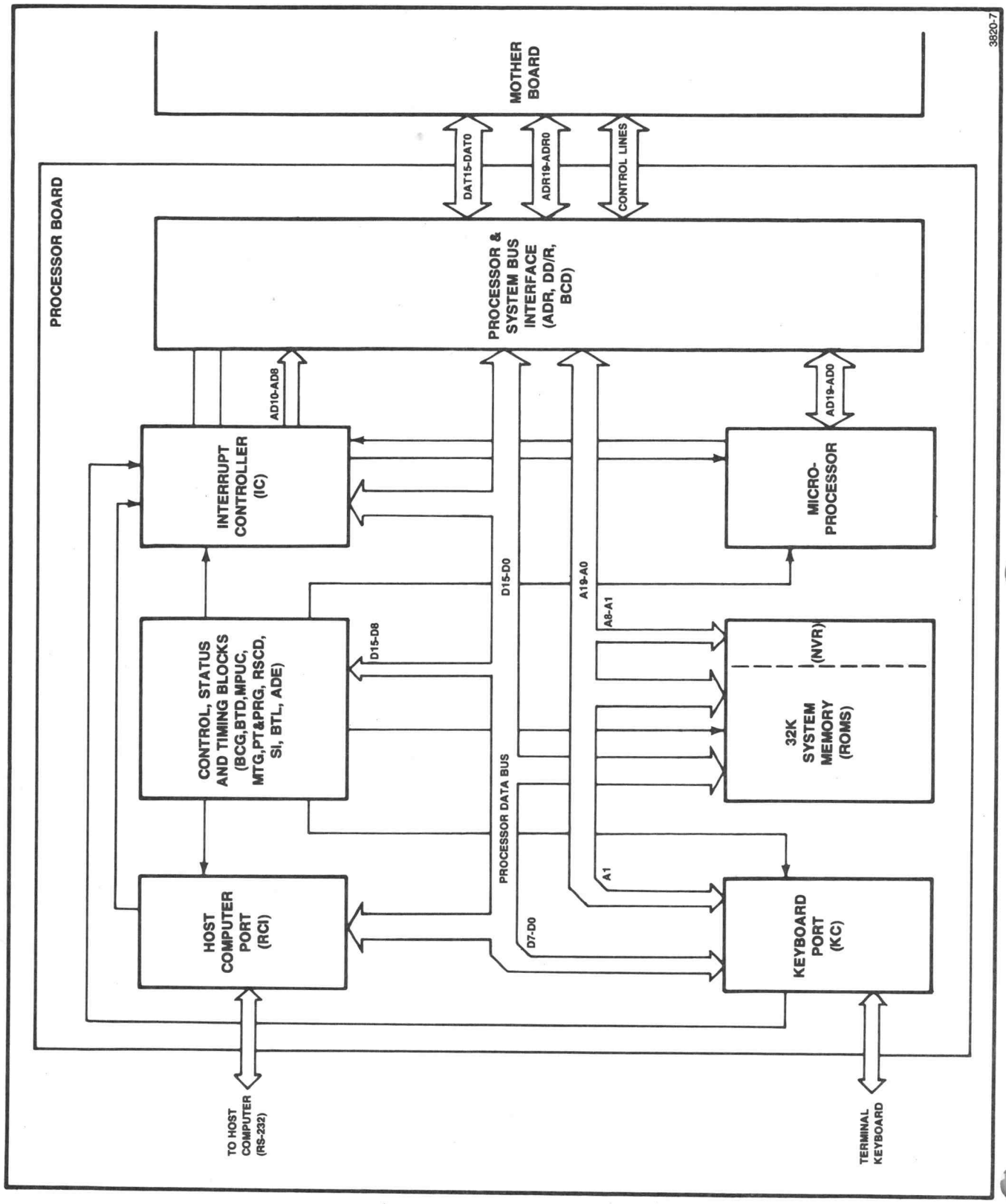

INSTRUMENT: 4113
NOTES:
DIAGRAM: POWER SUPPLY INTERCONNECT
SHEET: 1 OF 1
12618-S1
B1001 (ABOVE CARD CAGE)
B1002 (ABOVE POWER SUPPLY)
PEDESTAL TOP PANEL
A1 670-7500-00 MOTHERBOARD
CARD CAGE
+5 VOLTS
-5.2 VOLTS
+5.1 VOLTS (-2)
GND (-2)
-5.2 VOLTS (-1)
PFAIL-0
STEST-0
+12 VOLTS
+5.1 VOLTS
+5.1V SENSE
GND SENSE
+12V SENSE
-12V SENSE
-12 VOLTS
-5.2V SENSE
INIT-0
PSYNC-1
RESET-0
A13A2 670-0502-00 REGULATOR BD.
POWER SUPPLY HOUSING
A13A1 670-0503-03 INVERTER BD.
SDWN-0
PDWN-0
+22 VOLTS
GND
GND SENSE
+5V SENSE
PFAIL-0
INIT-0
PSYNC-1
RESET-0
SIGNAL NAMES
230V
115V
NEUTRAL
LINE
CENTER
NEUTRAL
FL1001 LINE FILTER
NEUTRAL LINE
OFF-1/ON-0
E1002
LINE FUSE
F3001 10A F 115V 5A F 230V
FL1002
J3001
J3002
AC POWER IN
AC DISPLAY POWER
POWER SUPPLY HEAT SINK
S3001 MAIN POWER
KEYBOARD/FLEXIBLE DISK DRIVE
DRAWER FRONT PANEL
S3002 SELF TEST
S3003 MASTERRESET
PEDESTAL FRONT PANEL

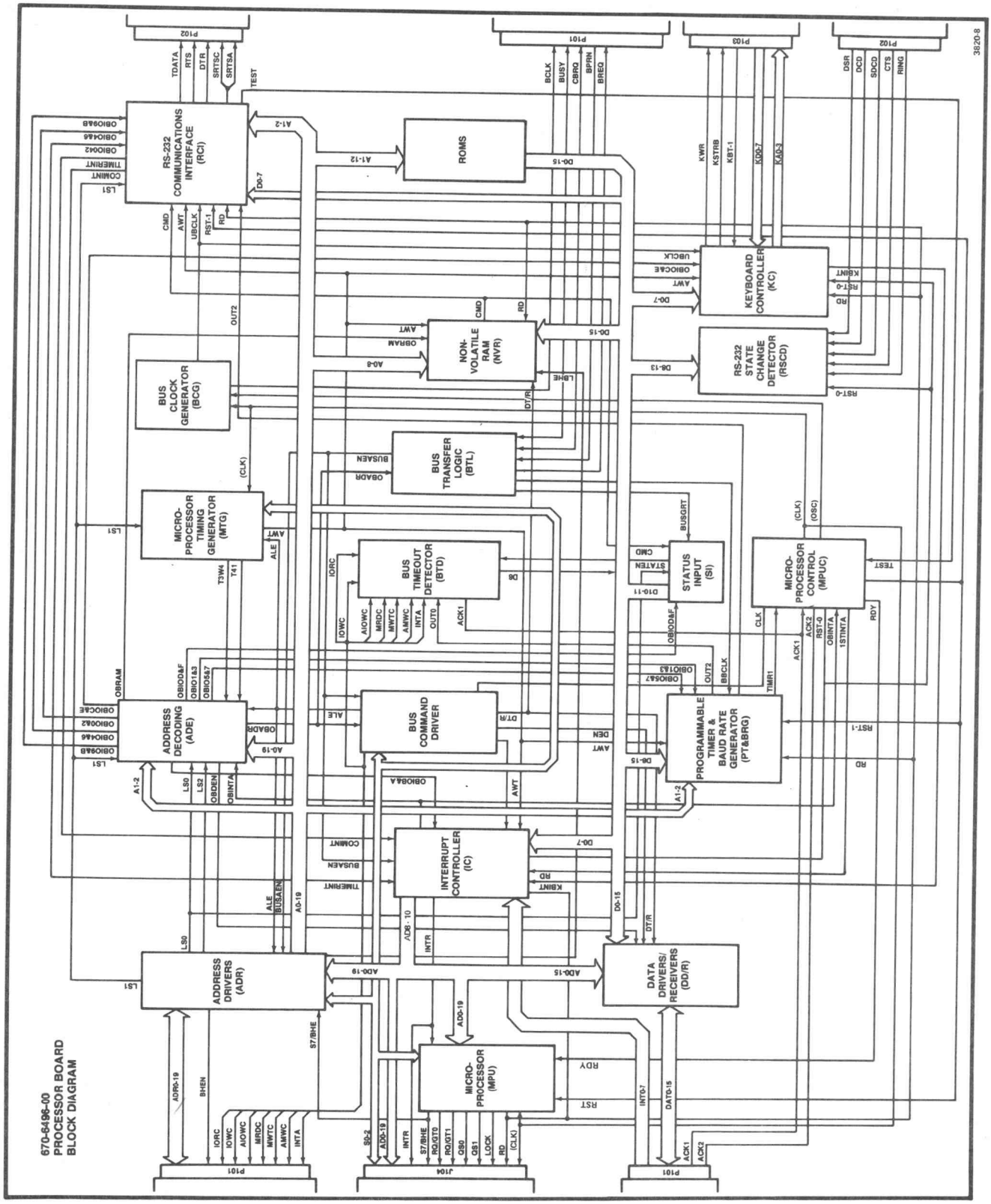

TO MODEM RS-232-C
REAR PANEL
CARD CAGE
A3 119-1400-00 KEYBOARD
KEYBOARD/FLEXIBLE DISK DRIVE DRAWER
A2 672-1047-00 PROCESSOR BOARD
A4 672-1045-00 RAM/ROM BOARD
A5 670-6770-00 RAM ARRAY BD.
A8 670-6474-02 VECTOR GENERATOR BOARD
A9 670-7568-00 SINGLE RASTER MEMORY BOARD
-OR-
A10 670-6475-01 OPT.21 DUAL RASTER MEM. BD.
A1 670-7566-00 MOTHERBOARD
(ALL) 80 PIN CONN.
(-3) 44 PIN CONN.
54 PIN CONN.
80 PIN CONN. (-1,2)
80 PIN CONN. (-1,2,4,5)
80 PIN CONN. (-1,3,4,5)
44 PIN CONN. (-1,2,4,5)
44 PIN CONN. (-1,3,4,5)
80 PIN CONN. (ALL)
44 PIN CONN. (ALL)
+5 VOLTS
-5 VOLTS
+12 VOLTS
-12 VOLTS
TDATA-0
RDATA-0
RTS-1
CTS-1
DTR-1
DSR-1
SRTSA-1
DCD-1
SRTSC-1
SDCD-1
SGND
RING-1
TCLK-1
RCLK-1
TXC-0
KSTB-0
KGND
KA3-1
KA2-1
KA1-1
KA0-1
KD7-1
KD6-1
KD5-1
KD4-1
KD3-1
KD2-1
KD1-1
KD0-1
KWR-0
NOTES: A10 670-6475-01 STD. DUAL RASTER MEM. BD. PLUGS INTO A1 670-7566-00 MOTHERBOARD
WITH J400 & J401 MATING RESPECTIVELY TO J32 & J43.
12618-S2
INSTRUMENT:
4113
DIAGRAM:
MOTHERBOARD INTERCONNECT
SHEET:
1 OF 1


INSTRUMENT: 4113
NOTES: * PIN 13 OF P424 & P300 CONTAIN INDEXING PLUGS.
12618-54
BOARD: PEDESTAL TO DISPLAY INTERCONNECT
ASSEMBLY-SHEET: 1 OF 1
FS001 USAGE
LINE VOLTAGE
FUSE AMPERAGE
100V 110V 120V
5A T
220V 240V
2.5A T
927823003 CONNECTOR PCB
NEUTRAL
LINE
FL1003 22Ω 0.1uF
LINE FILTER
A5001
FS001 *
K1001
SS RELAY
FOR CONTINUATION SEE MANUAL NUMBER
6482653200 DISPLAY REAR PANEL
DISPLAY POWER CABLE
P5001
P3002
J3002
DISPLAY POWER CONTROL
P5003
P3005
P195
P194
P192
P306
P304
P302
BLUE
GREEN
RED
V-SYNC
H-SYNC
J3007 HARD COPY
P361
J305
J303
N.C.
N.C.*
N.C.
P300
A12 670-7587-00 DISPLAY INTERCONNECT BD.
P286
P425
P424
CBUSY-0
MAKECOPY-0
HC VIDEO
STEST-0
* N.C.
DPC
MONVSYNC-0
MONHSYNC-0
MON BLUE
MON GREEN
MON RED
P280 80 PIN CONN. (-1,3,4)
P281 44 PIN CONN (ALL)
A7 670-6475-02 VIDEO CONTROLLER BD.
P420 80 PIN CONN. (ALL)
P421 44 PIN CONN. (ALL)
A11 670-7567-00 COLOR MAP BOARD
A1 670-7500-00 MOTHERBOARD
PEDESTAL REAR PANEL
CARD CAGE
J38
J41
J36
J47
(ALL) 80 PIN CONN.
(-3) 44 PIN CONN.
(ALL) 80 PIN CONN.
(-3) 44 PIN CONN.

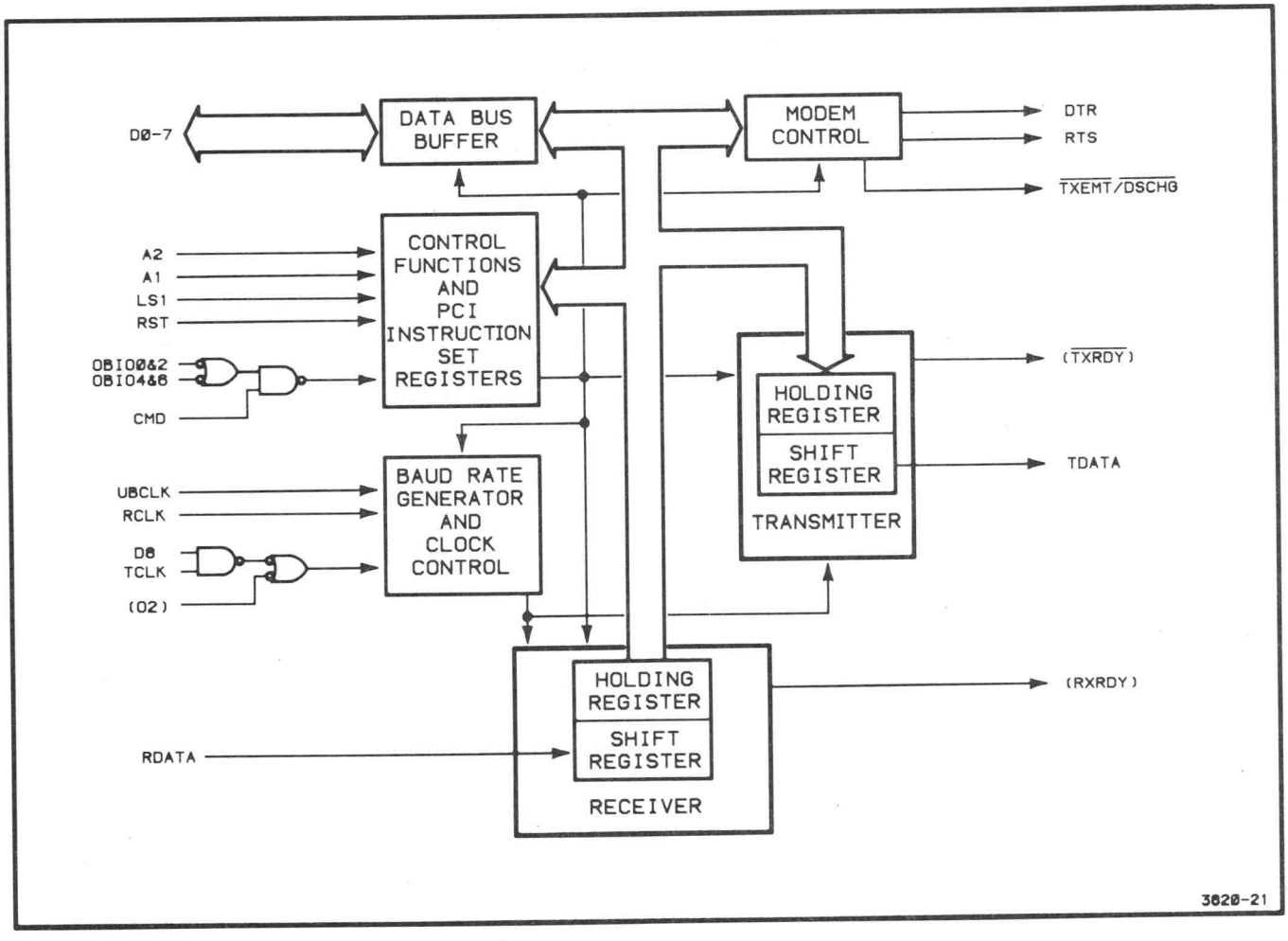
RAM BANK 2
OPT.26,27
28 AND 29
A5 670-6670-00 RAM ARRAY BD.
RAM BANK 0
OPT.24,25,26
27,28 AND 29
A5 670-6670-00 RAM ARRAY BD.
RAM BANK 3
OPT.27,28
AND 29
A5 670-6670-00 RAM ARRAY BD.
RAM BANK 1
OPT.25,26,27
28 AND 29
A5 670-6670-00 RAM ARRAY BD.
A6 670-6669-02 RAM CONTROLLER BD.
P100
80 PIN CONNECTOR (ALL).
* (ALL) 80 PIN CONNECTOR
*MAY BE ANY ONE OF THE FOLLOWING MOTHERBOARD-J20 THRU J29
A1 670-7565-00 MOTHERBOARD
INSTRUMENT:
4113 OPTION
24 thru 29
NOTES:
DIAGRAM:
RAM CONTROLLER
INTERCONNECT
12618-S3
SHEET:
1 OF 1



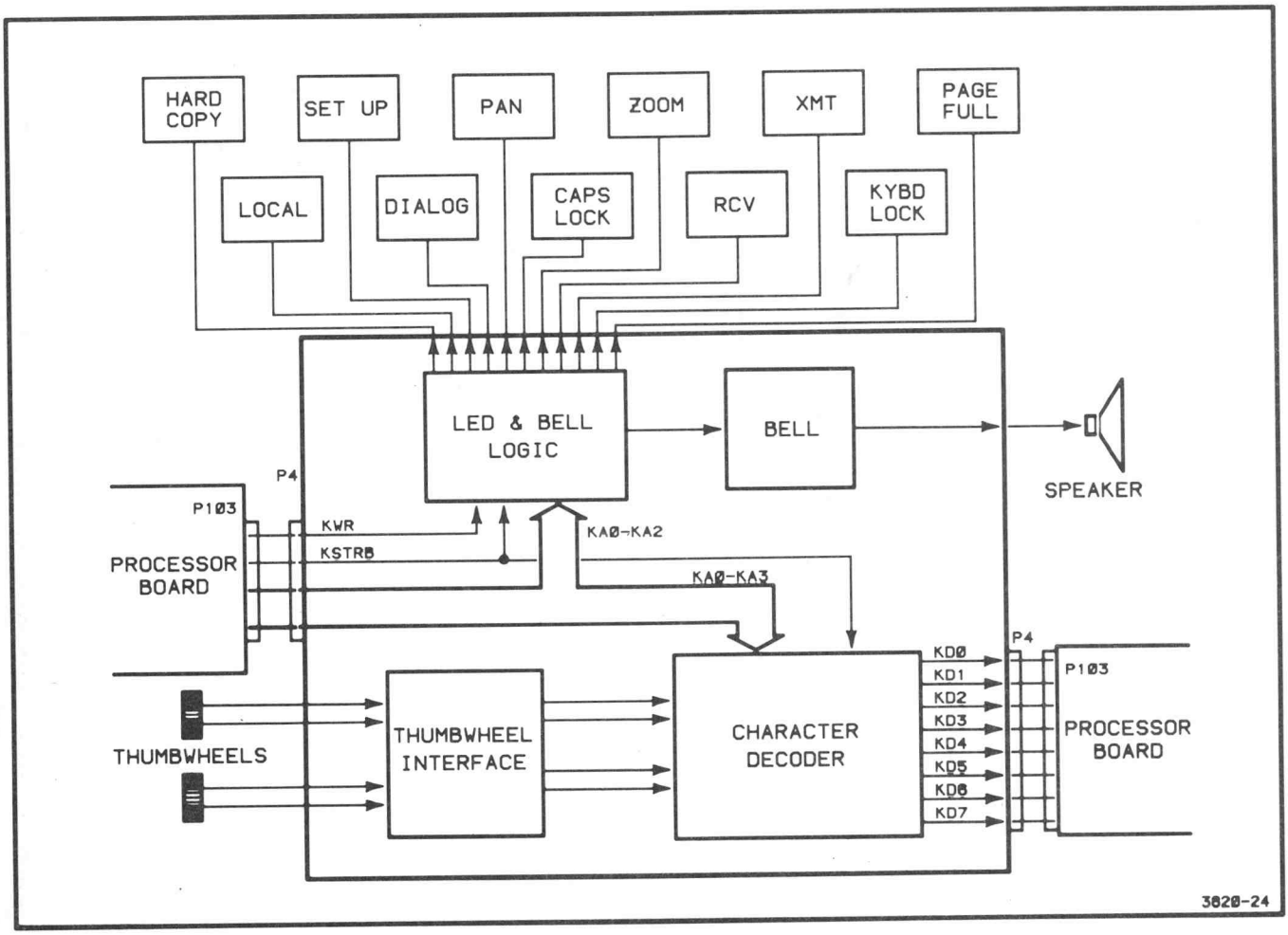
Simplified Processor Board.



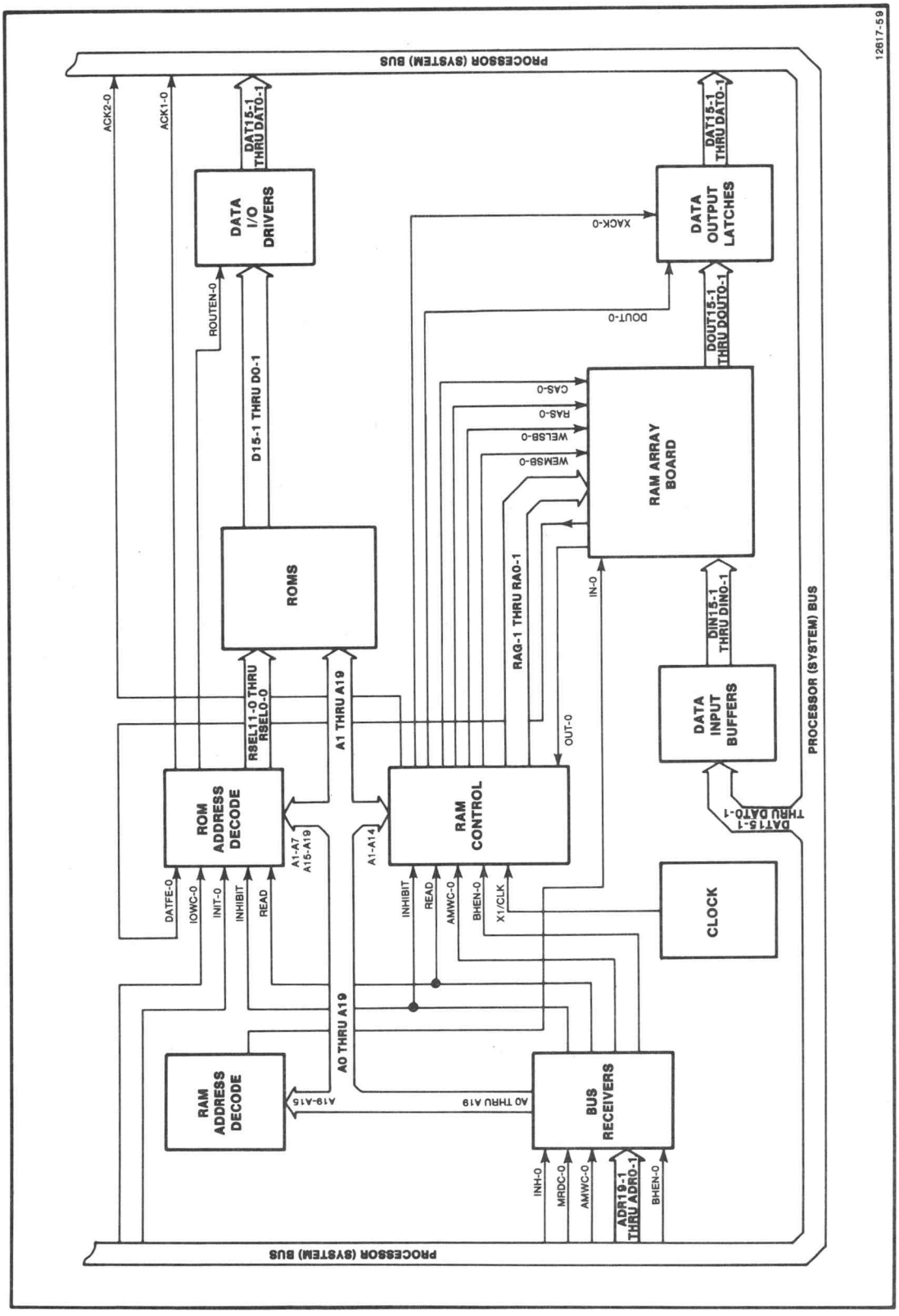
Processor Board.



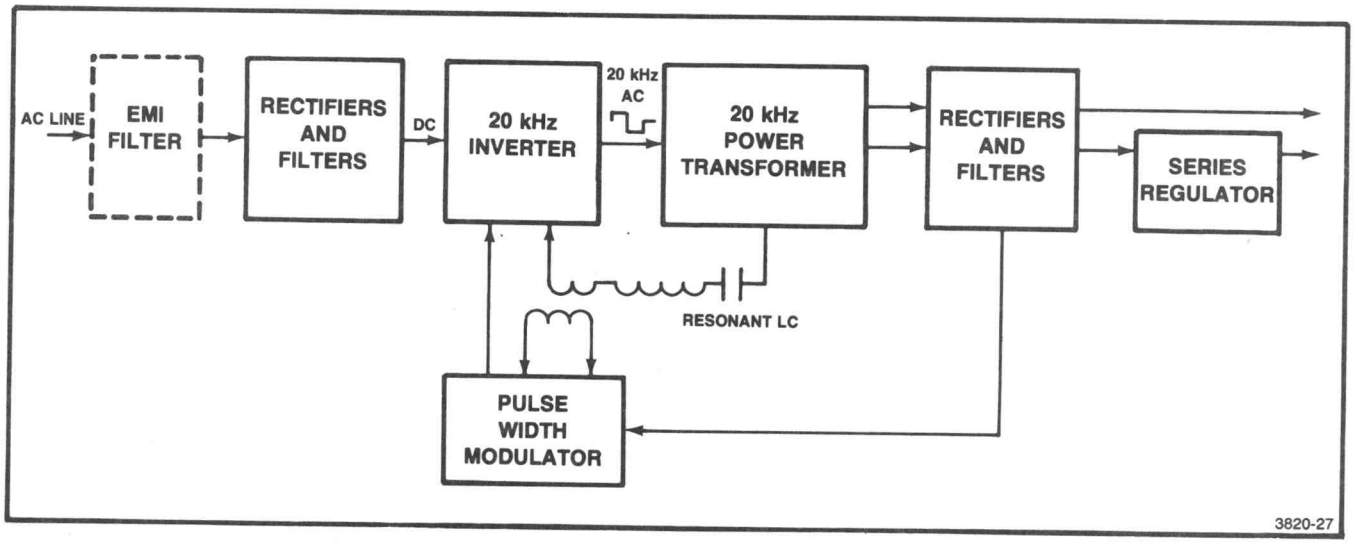
Programmable Communications Interface.


HARD COPY
SET UP
PAN
ZOOM
XMT
PAGE FULL
LOCAL
DIALOG
CAPS LOCK
RCV
KYBD LOCK
LED & BELL LOGIC
BELL
SPEAKER
P4
P103
PROCESSOR BOARD
KWR
KSTRB
KA0-KA2
KA0-KA3
THUMBWHEELS
THUMBWHEEL INTERFACE
CHARACTER DECODER
KD0
KD1
KD2
KD3
KD4
KD5
KD6
KD7
P4
P103
PROCESSOR BOARD
3820-24

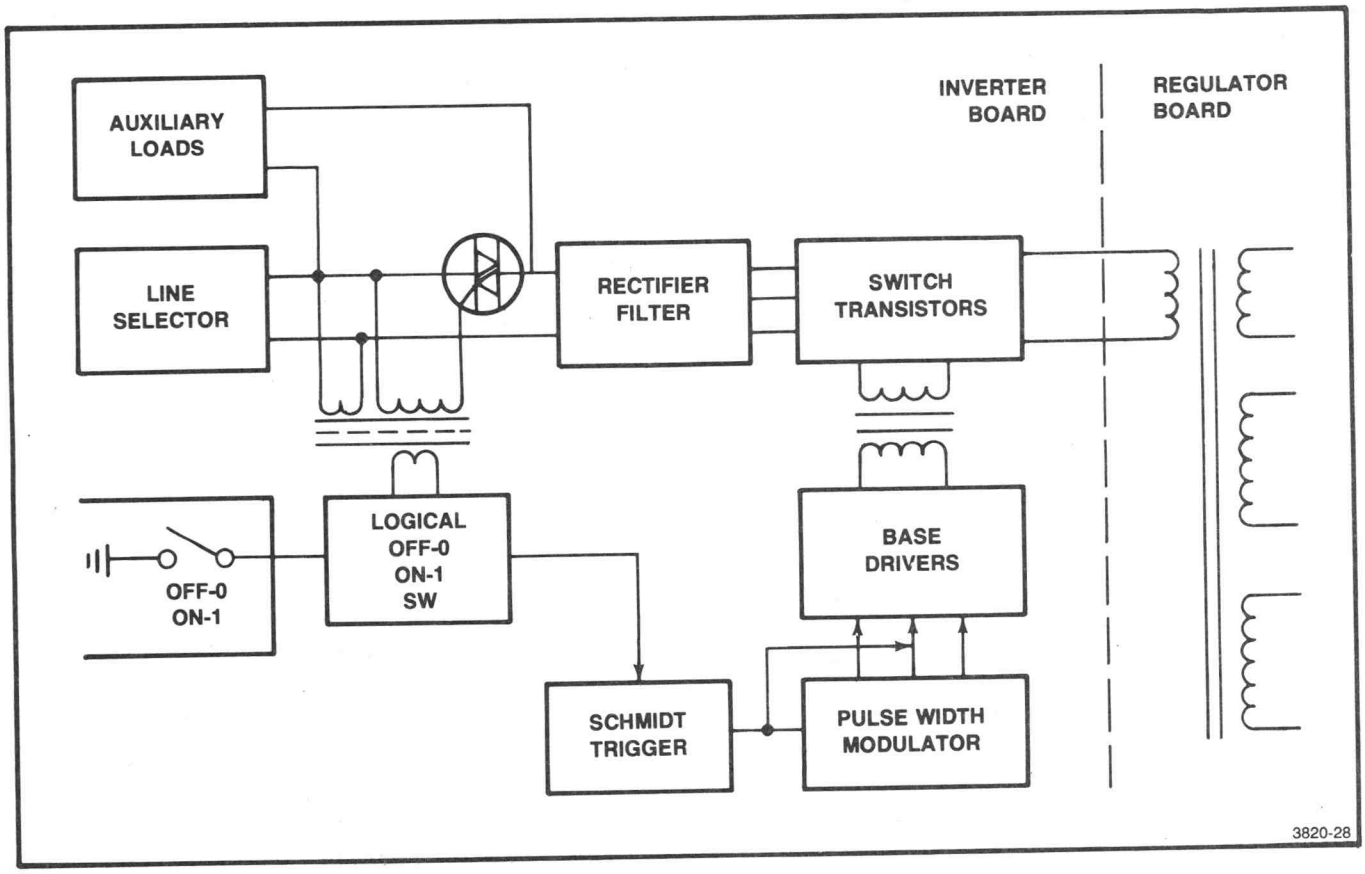
Keyboard.



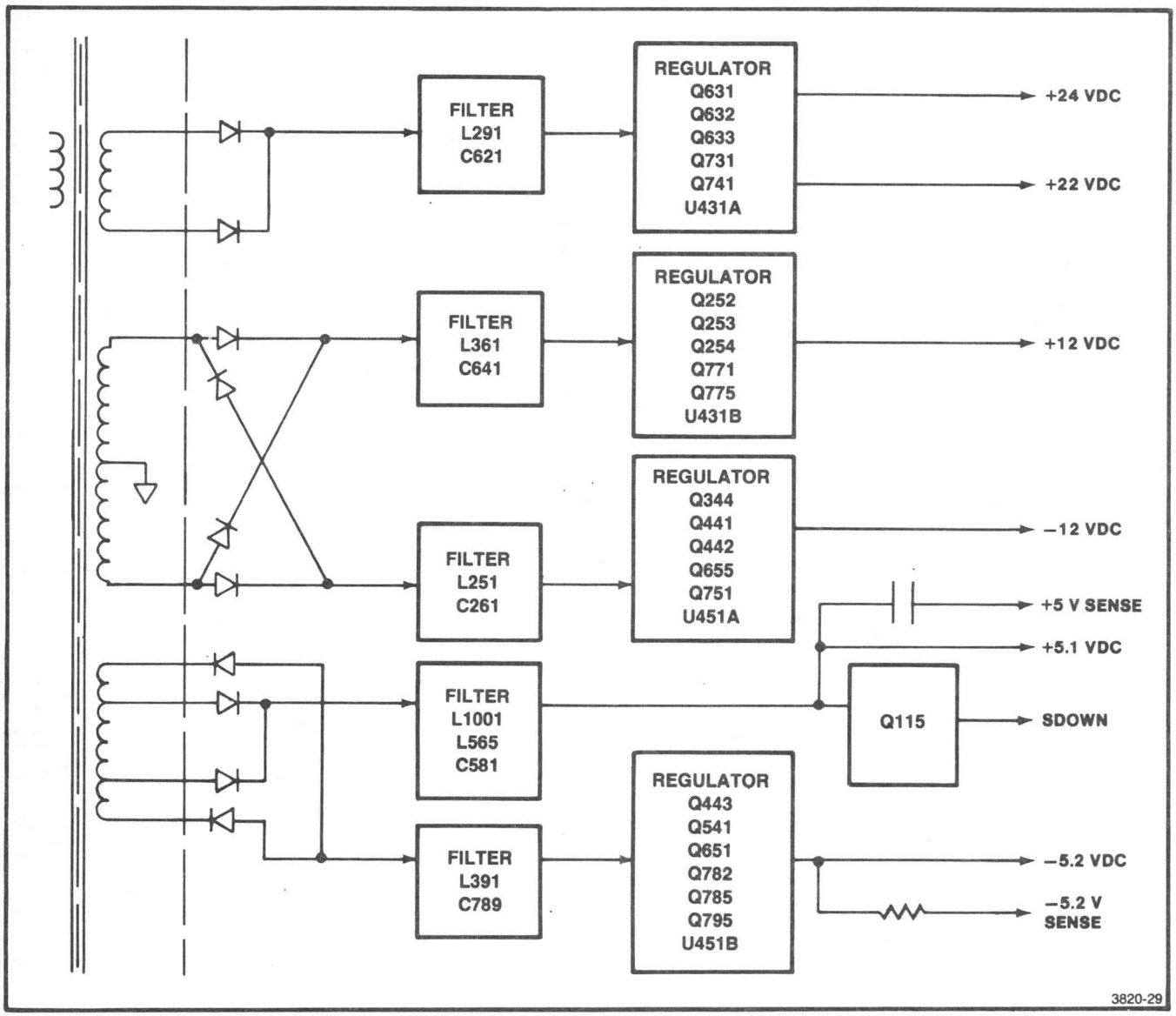
RAM/ROM Board.



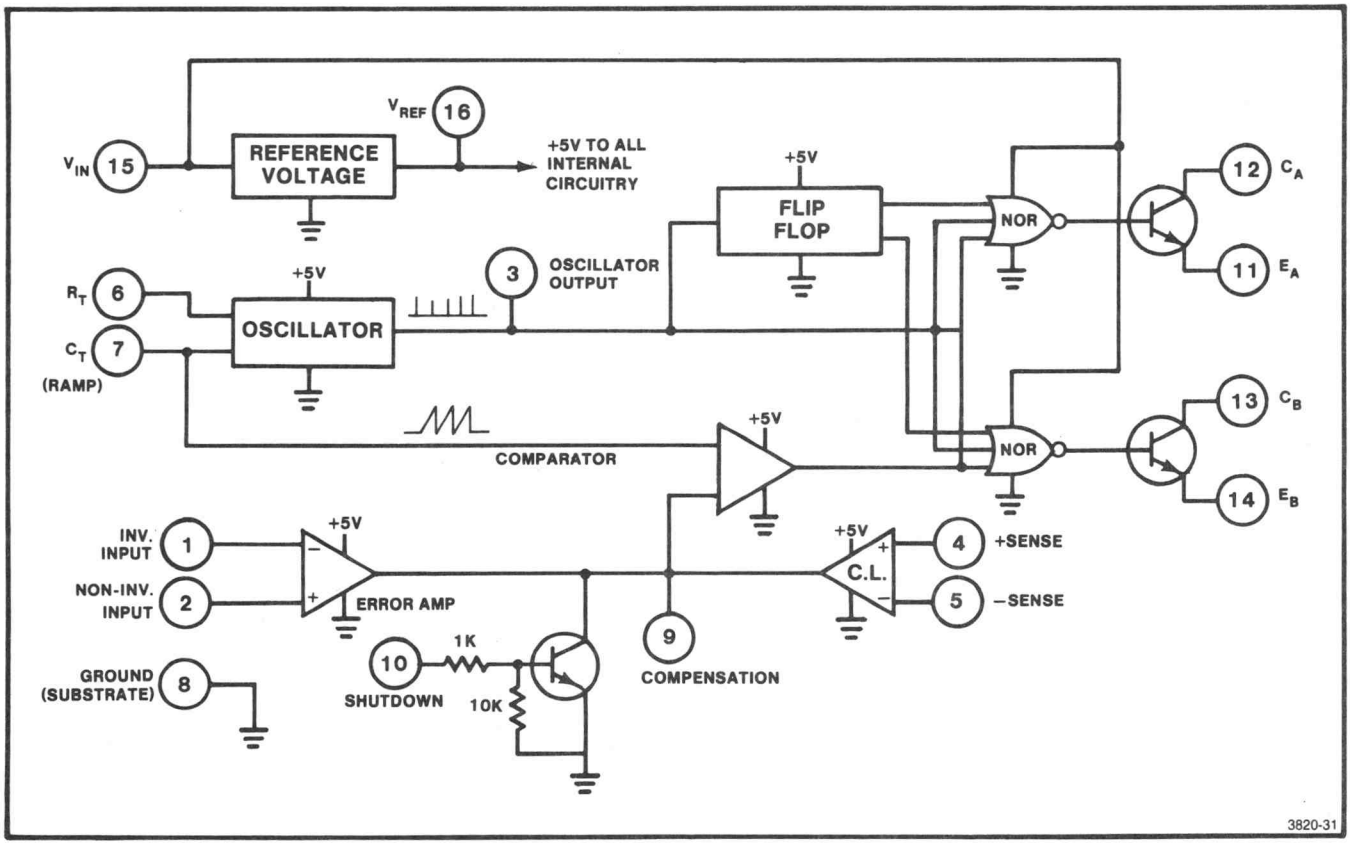
High Efficiency Power Supply.



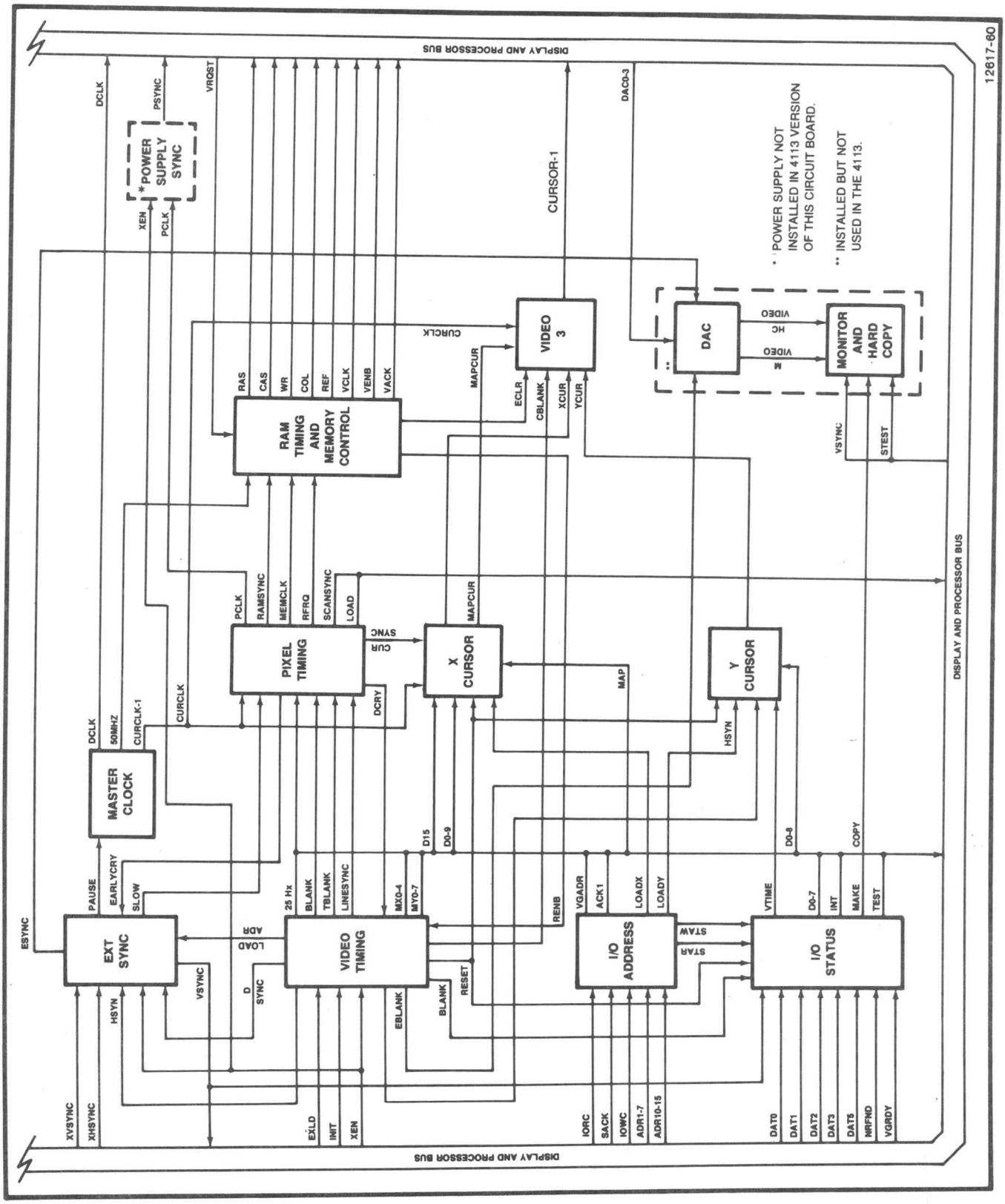
Power Supply Inverter Board.



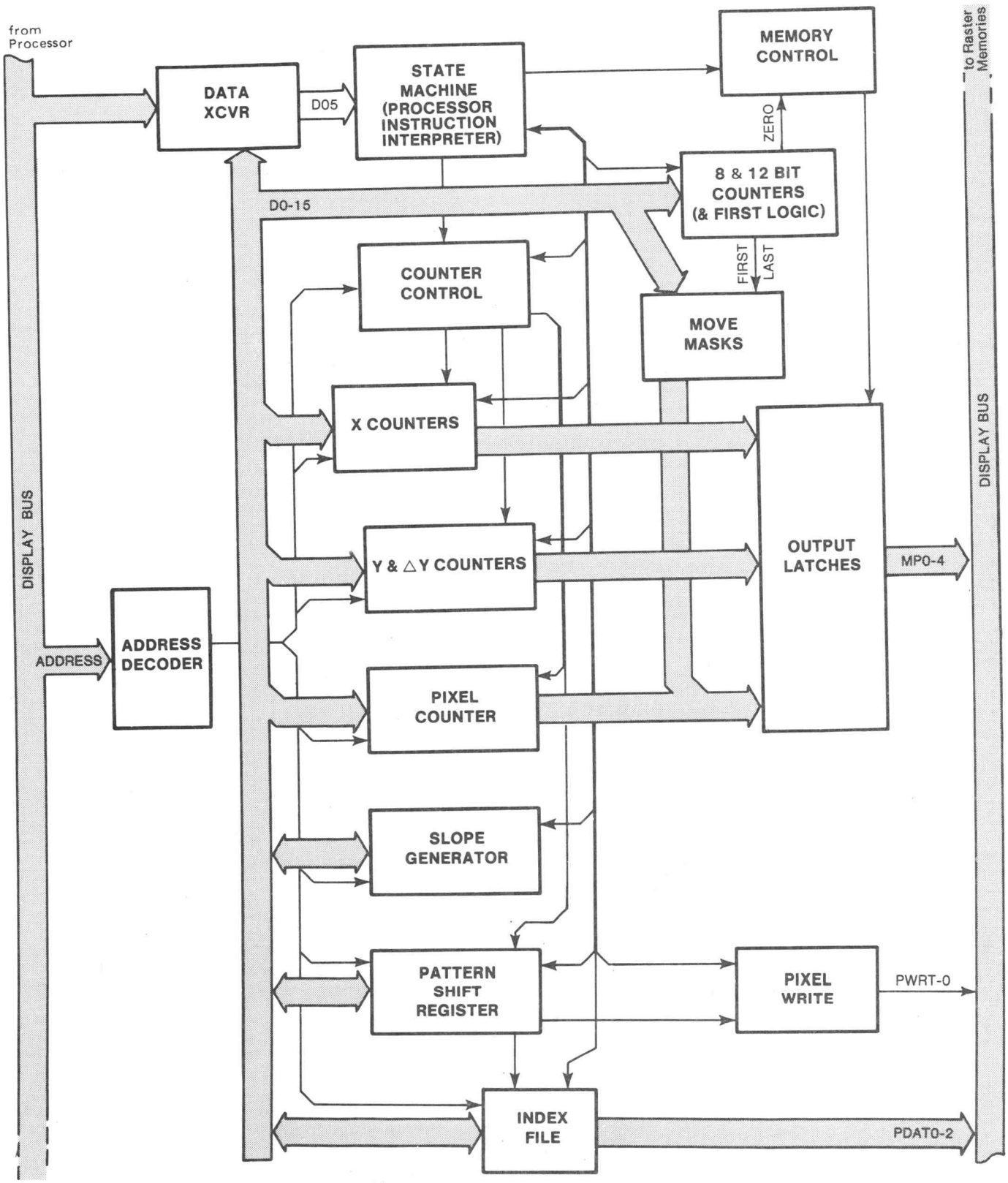
Power Supply Regulator Board.



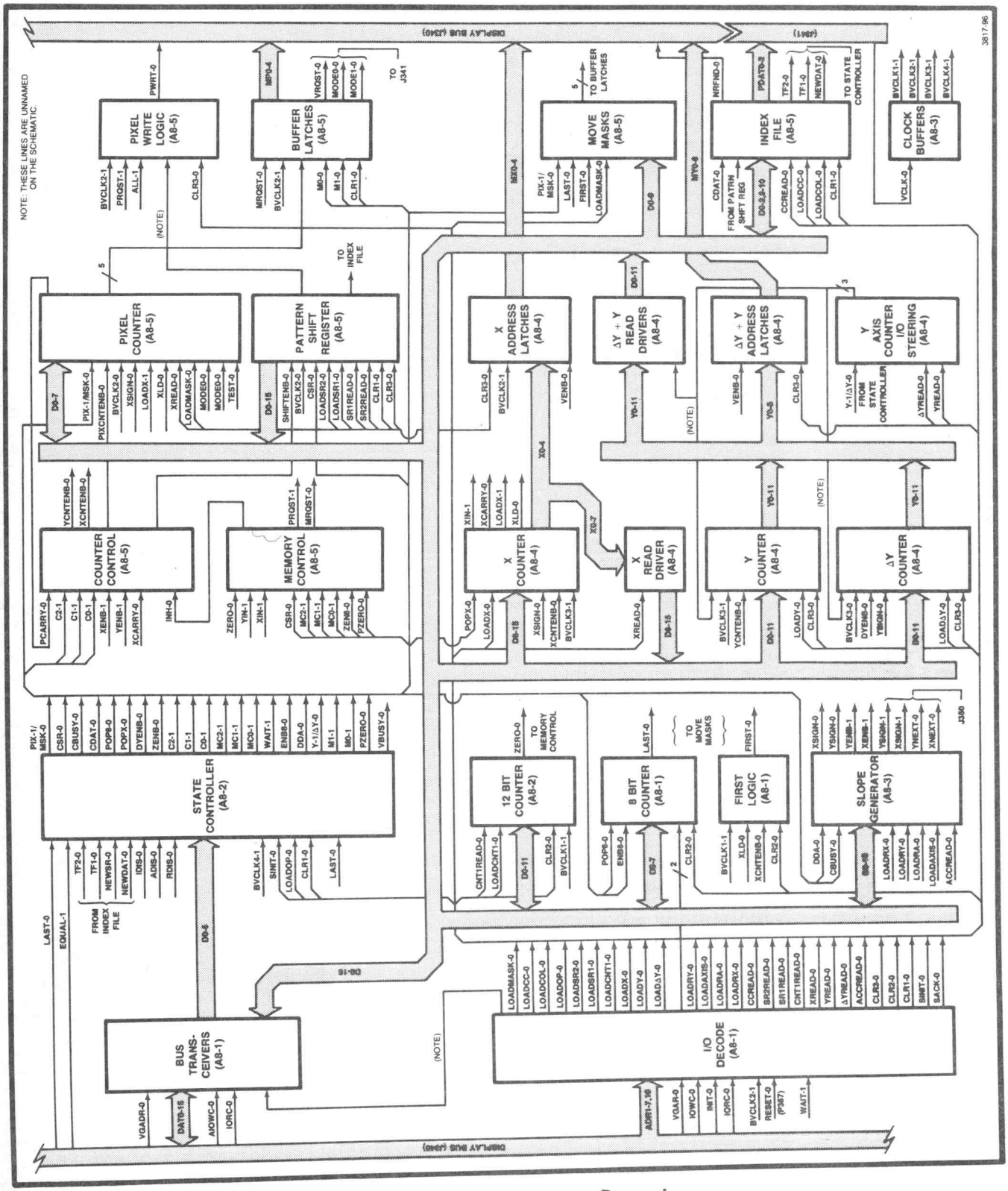
Power Supply Pulse Width Modulator.



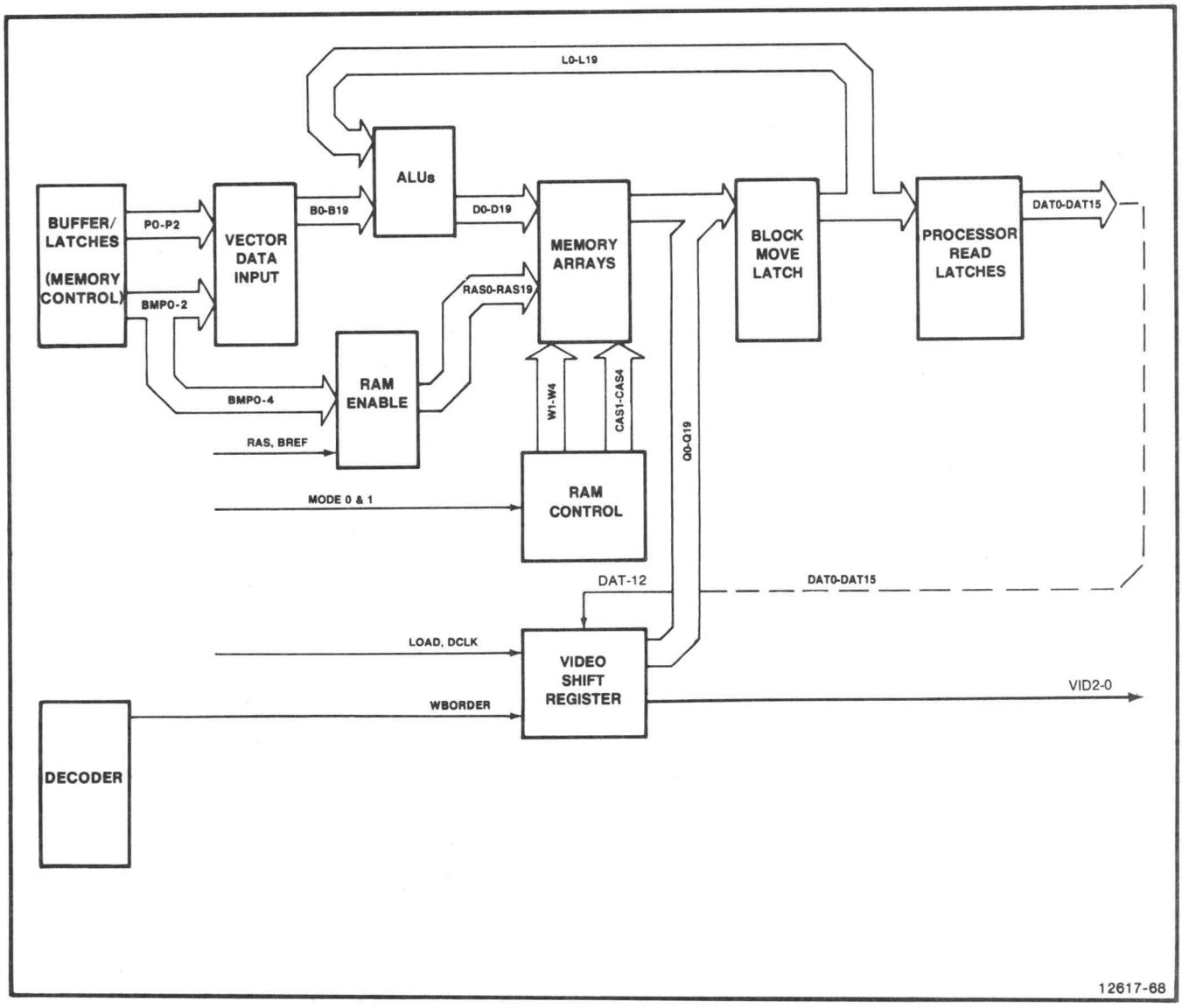
Video Controller Board.



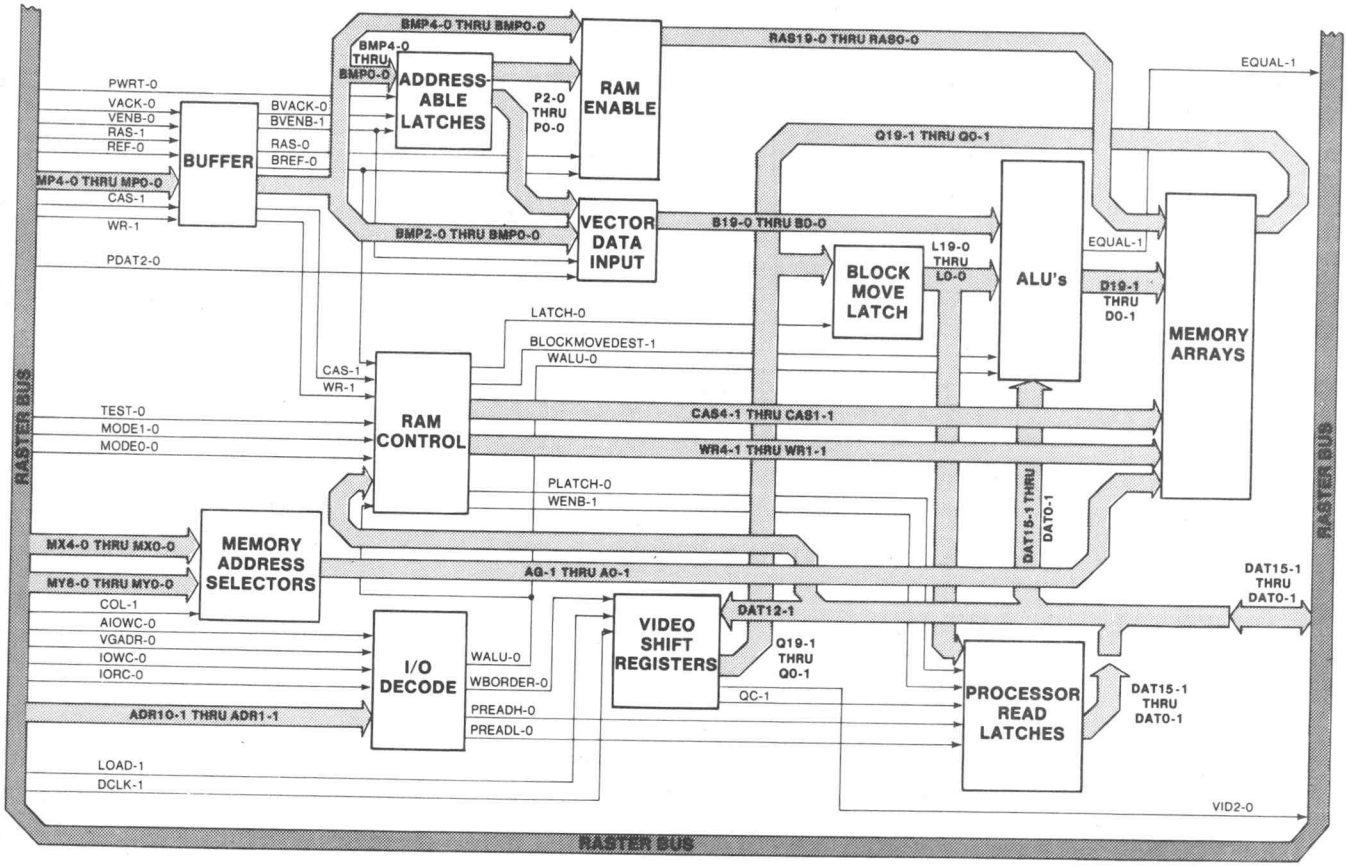
Simplified Vector Generator Board.



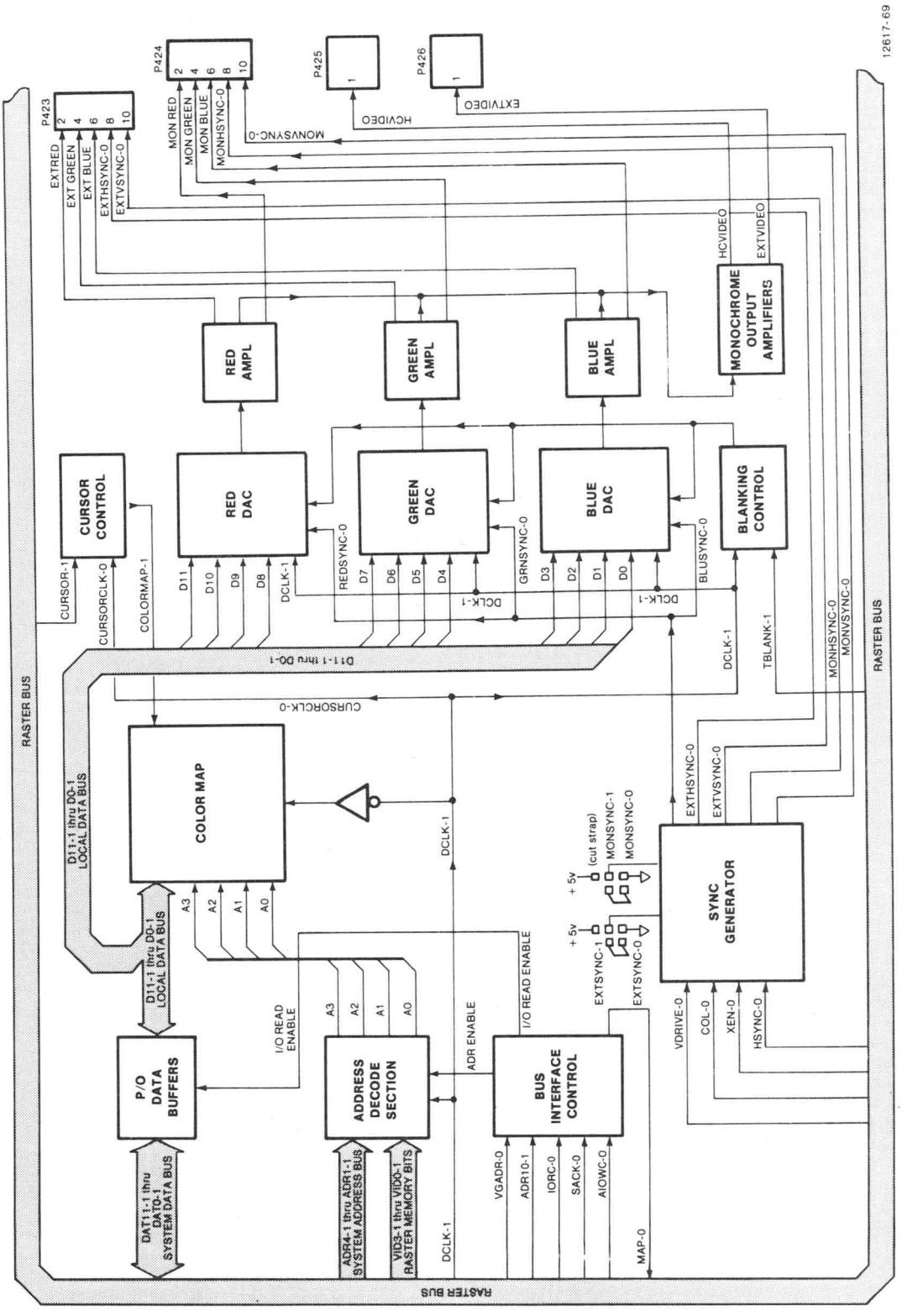
Vector Generator Board.



Simplified Single Plane Raster Memory Board.



Single Plane Raster Memory Board.



Color Map Board.

Section 5
SCHEMATICS

Symbols and Reference Designators

Electrical components shown on the diagrams are in the following units unless noted otherwise:

Capacitors = Values one or greater are in picofarads (pF).
Values less than one are in microfarads (μF).

Resistors = Ohms (Ω).

Graphic symbols and class designation letters are based on ANSI Standard Y32.2-1975.

Logic symbology is based on ANSI Y32.14-1973 in terms of positive logic. Logic symbols depict the logic function performed and may differ from the manufacturer's data.

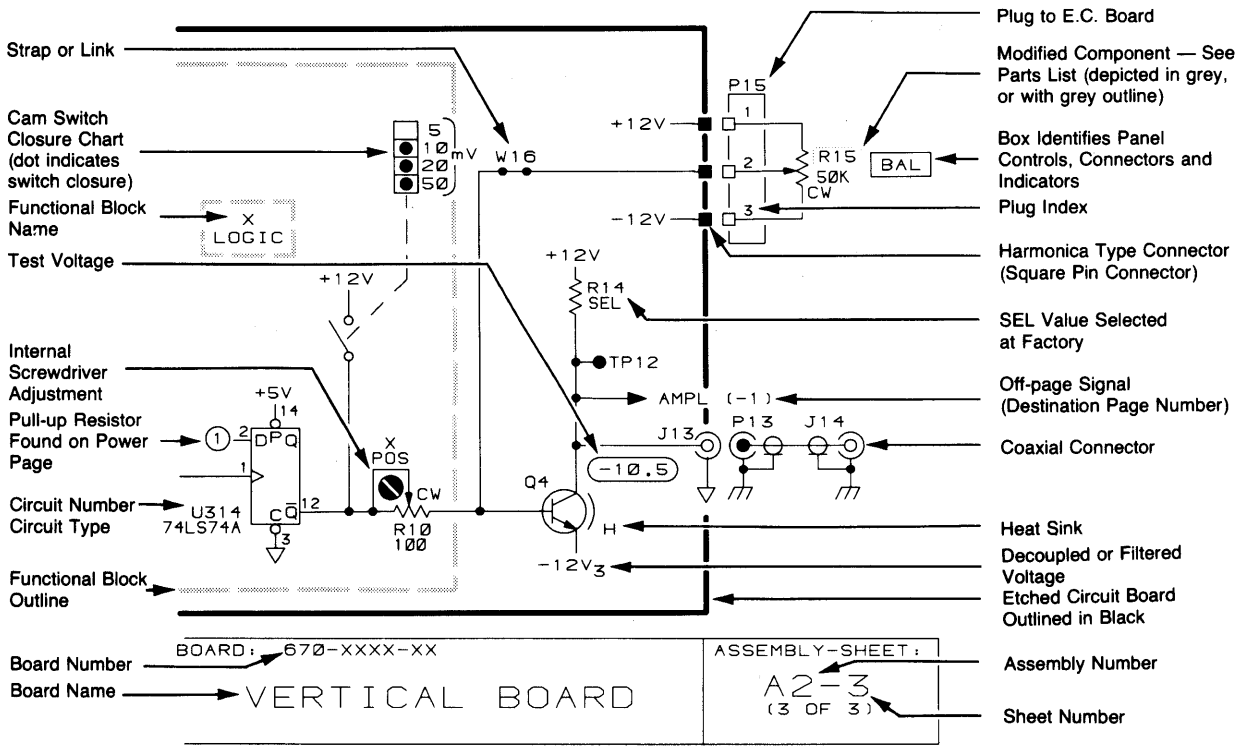
Abbreviations are based on ANSI Y1.1-1972. Other ANSI standards that are used in the preparation of diagrams by Tektronix, Inc., are:

Y14.15, 1966	Drafting Practices.
Y14.2, 1973	Line Conventions and Lettering.
Y10.5, 1968	Letter Symbols for Quantities Used in Electrical Science and Electrical Engineering.

The following prefix letters are used as reference designators to identify components or assemblies on the diagrams.

A	Assembly, separable or repairable (circuit board, etc.)	H	Heat dissipating device (heat sink, heat radiator, etc.)	S	Switch or contactor
AT	Attenuator, fixed or variable	HR	Heater	T	Transformer
B	Motor	HY	Hybrid circuit	TC	Thermocouple
BT	Battery	J	Connector, stationary portion	TP	Test point
C	Capacitor, fixed or variable	K	Relay	U	Assembly, inseparable or non-repairable (integrated circuit, etc.)
CB	Circuit breaker	L	Inductor, fixed or variable	V	Electron tube
CR	Diode, signal or rectifier	M	Meter	VR	Voltage regulator (zener diode, etc.)
DL	Delay line	P	Connector, movable portion	W	Wirestrap or cable
DS	Indicating device (lamp)	Q	Transistor or silicon-controlled rectifier	Y	Crystal
E	Spark Gap, Ferrite bead	R	Resistor, fixed or variable	Z	Phase shifter
F	Fuse	RT	Thermistor		
FL	Filter				

The following special symbols may appear on the diagrams:



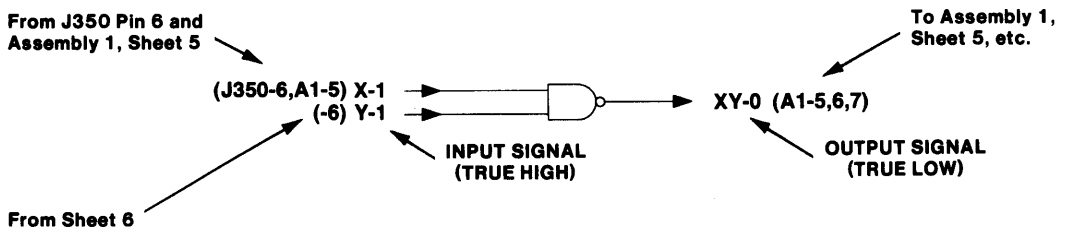
1. True High and True Low Signals

Signal names on the schematics are followed by -1 or a -0. A TRUE HIGH signal is indicated by -1, and a TRUE LOW signal is indicated by -0.

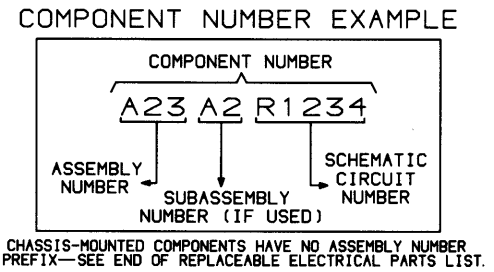
SIGNAL -1 = TRUE HIGH
SIGNAL -0 = TRUE LOW

2. Cross-References

Schematic cross-references (from/to information) are included on the schematics. The "from" reference only indicates the signal "source," and the "to" reference lists all loads where the signal is used. All from/to information will be enclosed in parentheses.

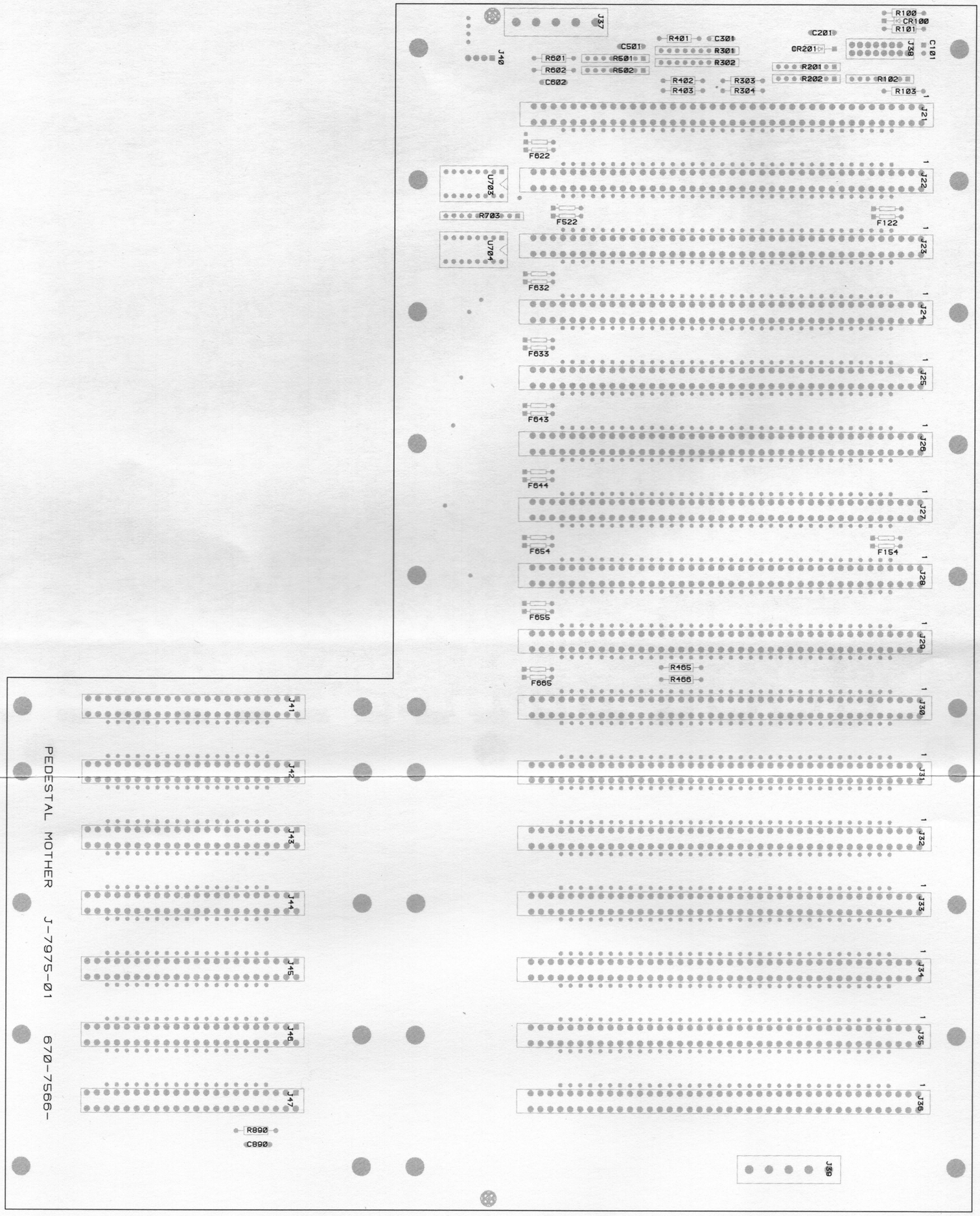

From J350 Pin 6 and Assembly 1, Sheet 5
To Assembly 1, Sheet 5, etc.
(J350-6,A1-5) X-1
(-6) Y-1
XY-0 (A1-5,6,7)
INPUT SIGNAL (TRUE HIGH)
OUTPUT SIGNAL (TRUE LOW)
From Sheet 6

3. Component Number Example

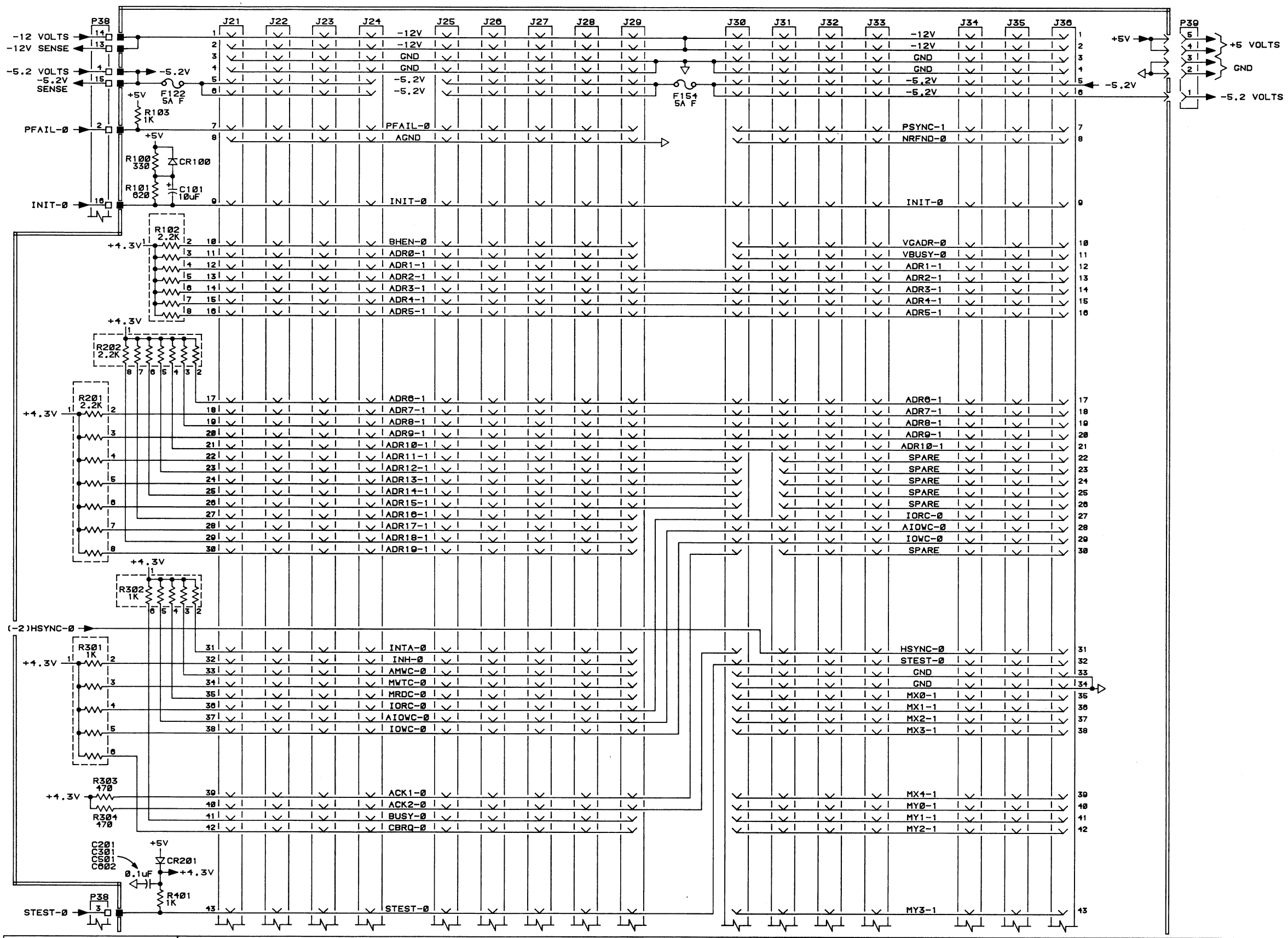

COMPONENT NUMBER EXAMPLE
COMPONENT NUMBER
A23 A2 R1234
ASSEMBLY NUMBER
SUBASSEMBLY NUMBER (IF USED)
SCHEMATIC CIRCUIT NUMBER
CHASSIS-MOUNTED COMPONENTS HAVE NO ASSEMBLY NUMBER PREFIX—SEE END OF REPLACEABLE ELECTRICAL PARTS LIST.

INDEX
4113 SCHEMATICS

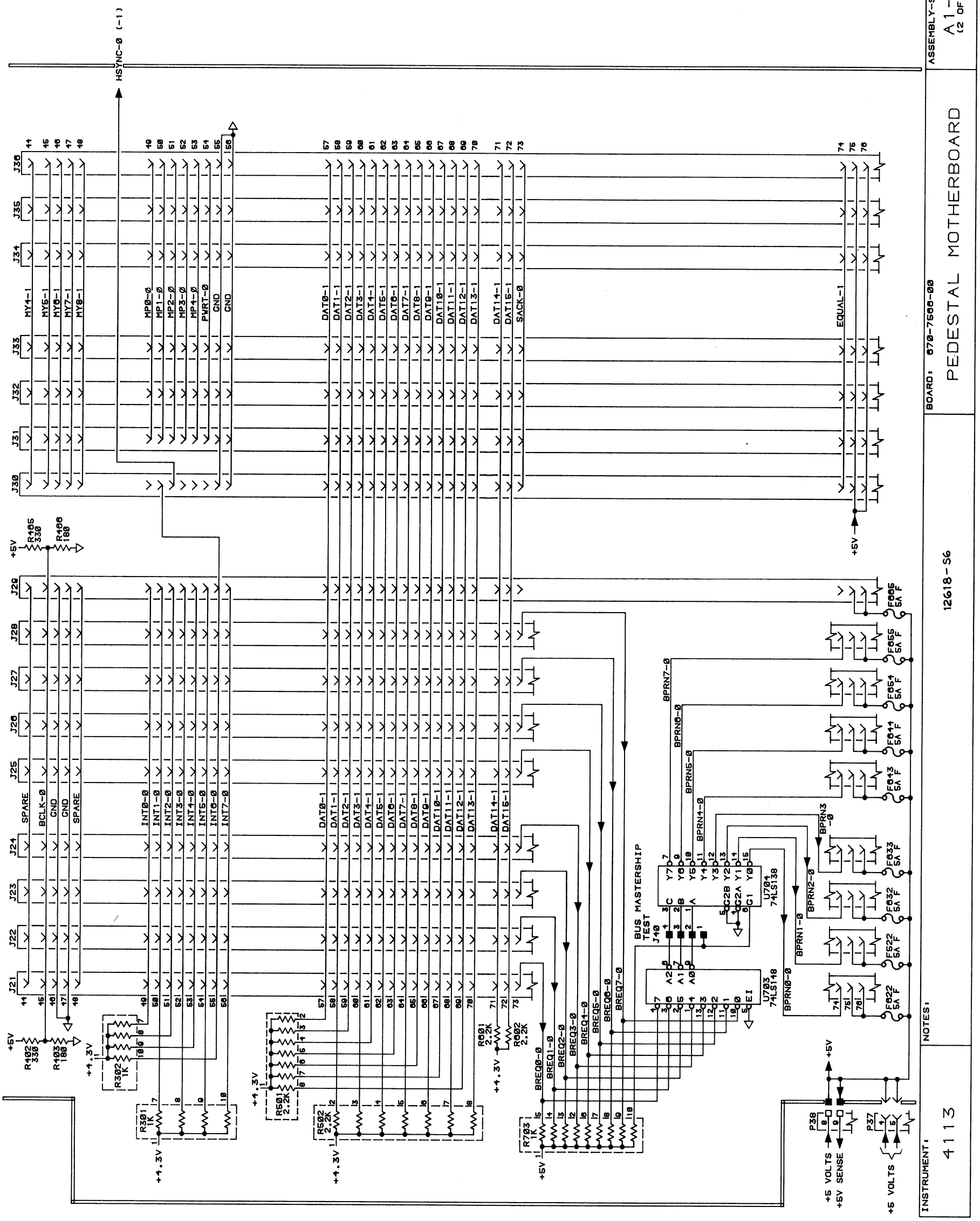
Name	Assembly No./ Sheets	Board Number(s)
Pedestal Motherboard	A1-1,-2,-3	670-7566-00
Processor Board	A2A1-1,-2,-3,-4,-5	672-1047-00 (670-6496-00)
Keyboard	A3-1	119-1400-00
RAM/ROM Board	A4A1-1,-2,-3	672-1045-00 (670-7565-00)
RAM Array Board	A5-1	670-6670-00
RAM Controller Board	A6-1,-2	670-6669-02
Video Controller Board	A7A1-1,-2,-3,-4	672-1003-00 672-1004-02 (670-6475-02)
Vector Generator Board	A8-1,-2,-3,-4,-5	670-6474-02
Single Raster Memory Board	A9-1,-2,-3,-4,-5,-6,-7	670-7568-00
Dual Raster Memory Board	A10-1,-2,-3,-4,-5,-6,-7	670-6476-01
Dual Raster Memory Board (Option 21)	A10-1,-2,-3,-4,-5,-6,-7	670-6476-01
Color Map Board	A11-1,-2,-3	670-7567-00
Display Interconnect Board	A12-1	670-7587-00
Inverter Board	A13A1-1	670-6503-02,-03
Regulator Board	A13A2-1	670-6502-00
067-1005-00 41XX Logic Extender	A14-1,-2	670-5291-00



Pedestal Motherboard (670-7566-00) Component Locations.



INSTRUMENT:	NOTES:	BOARD: 670-7566-00	ASSEMBLY-SHEET:
4113	12618-S5	PEDESTAL MOTHERBOARD	A1-1 (1 OF 3)



ASSEMBLY-SHEET: A1-2 (2 OF 3)

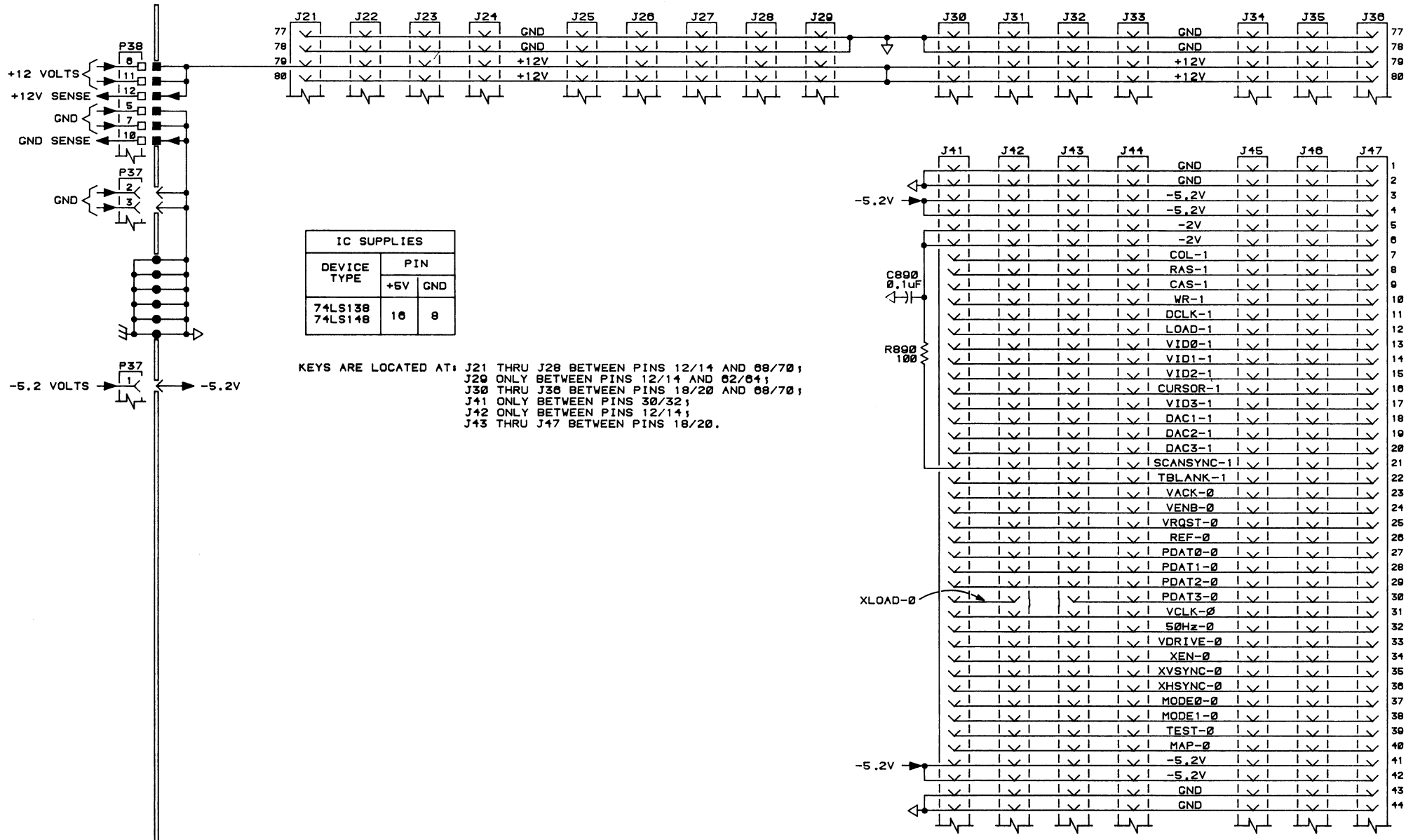
BOARD: 670-7566-00

PEDESTAL MOTHERBOARD

12618-S6

INSTRUMENT: 4113

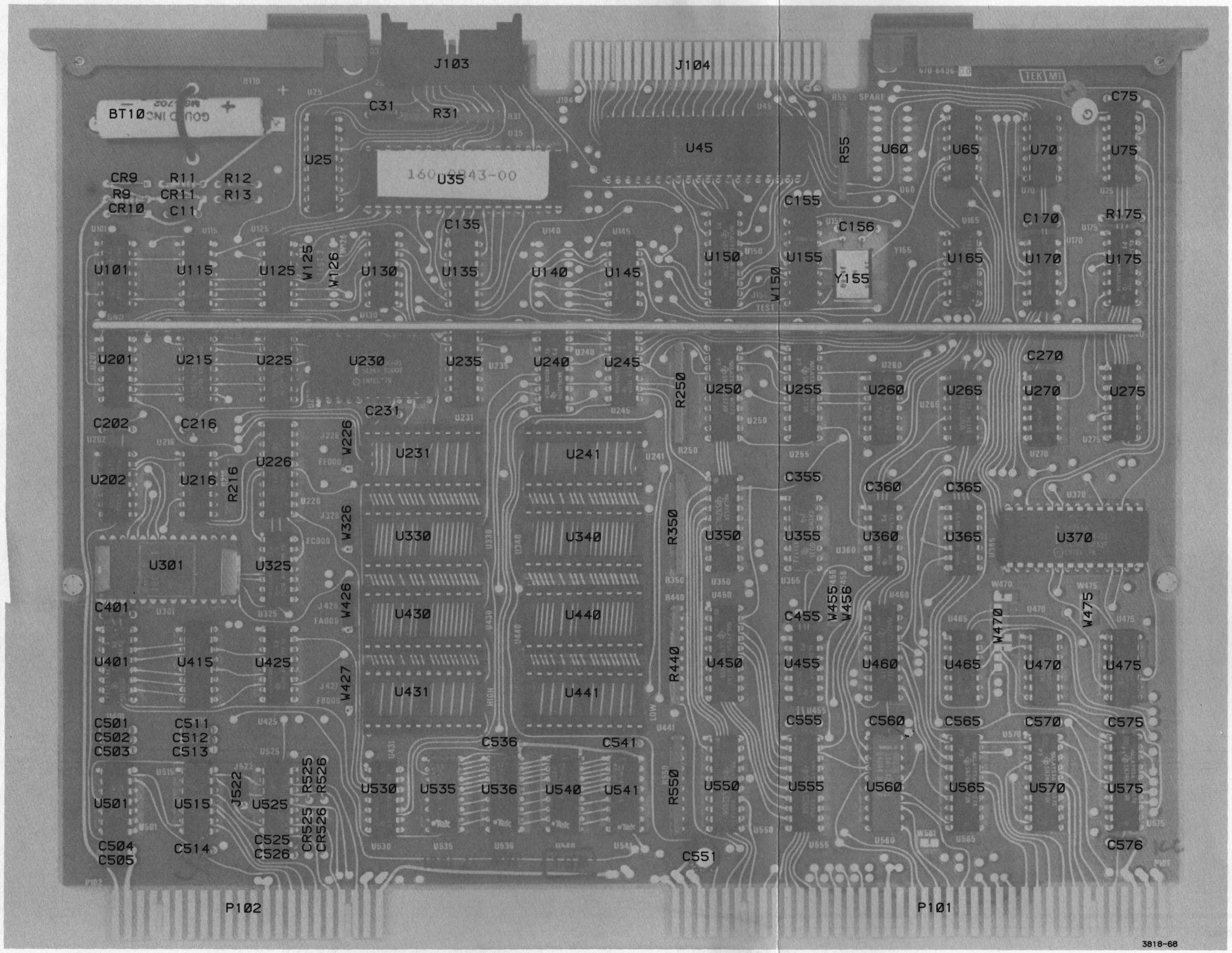
NOTES:



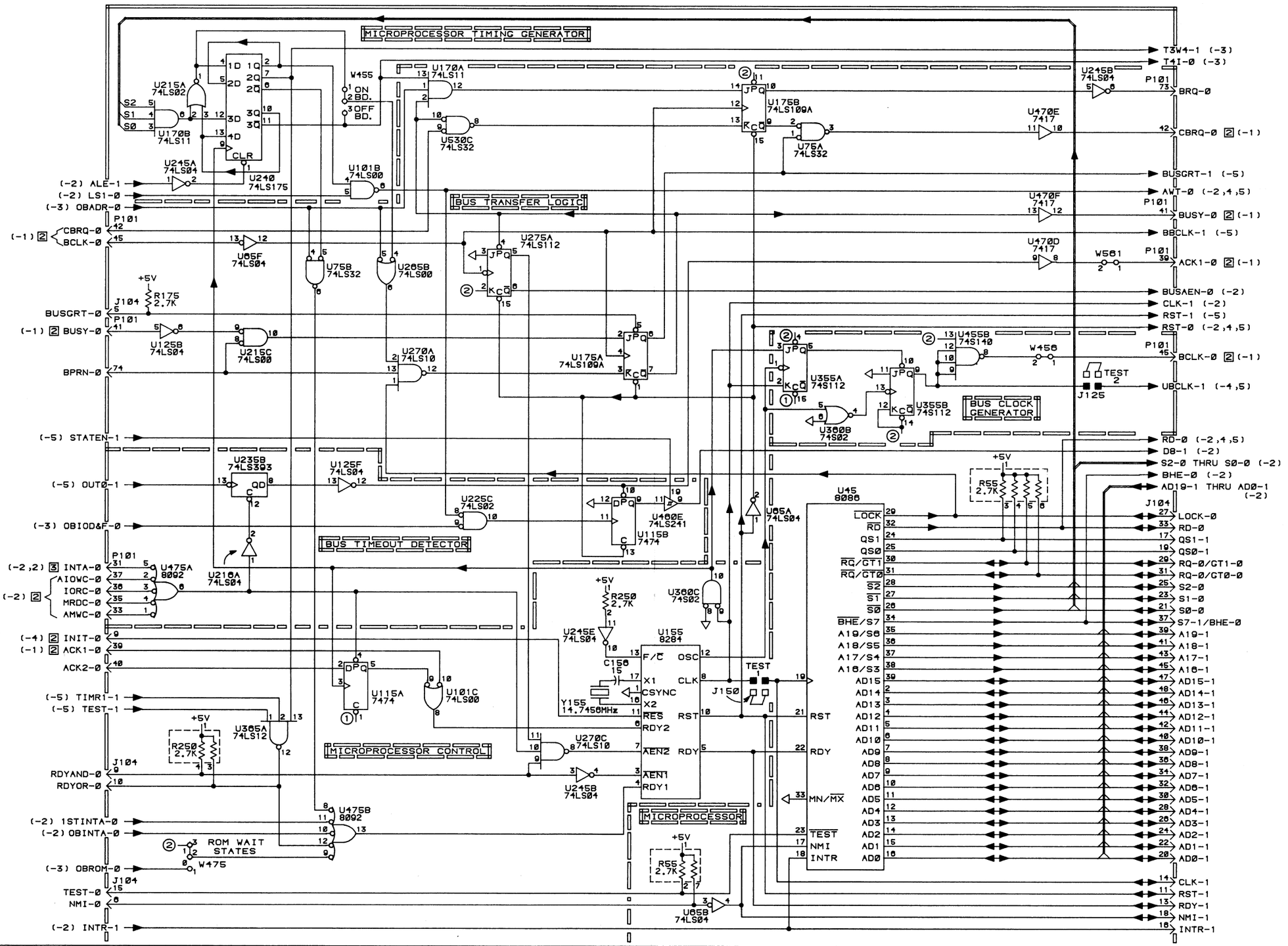
IC SUPPLIES		
DEVICE TYPE	PIN	
	+5V	GND
74LS138 74LS148	16	8

KEYS ARE LOCATED AT: J21 THRU J28 BETWEEN PINS 12/14 AND 68/70;
J29 ONLY BETWEEN PINS 12/14 AND 62/64;
J30 THRU J36 BETWEEN PINS 18/20 AND 68/70;
J41 ONLY BETWEEN PINS 30/32;
J42 ONLY BETWEEN PINS 12/14;
J43 THRU J47 BETWEEN PINS 18/20.

INSTRUMENT:	NOTES:	BOARD: 670-7566-00	ASSEMBLY-SHEET:
4113	12618-S7	PEDESTAL MOTHERBOARD	A1-3 (3 OF 3)



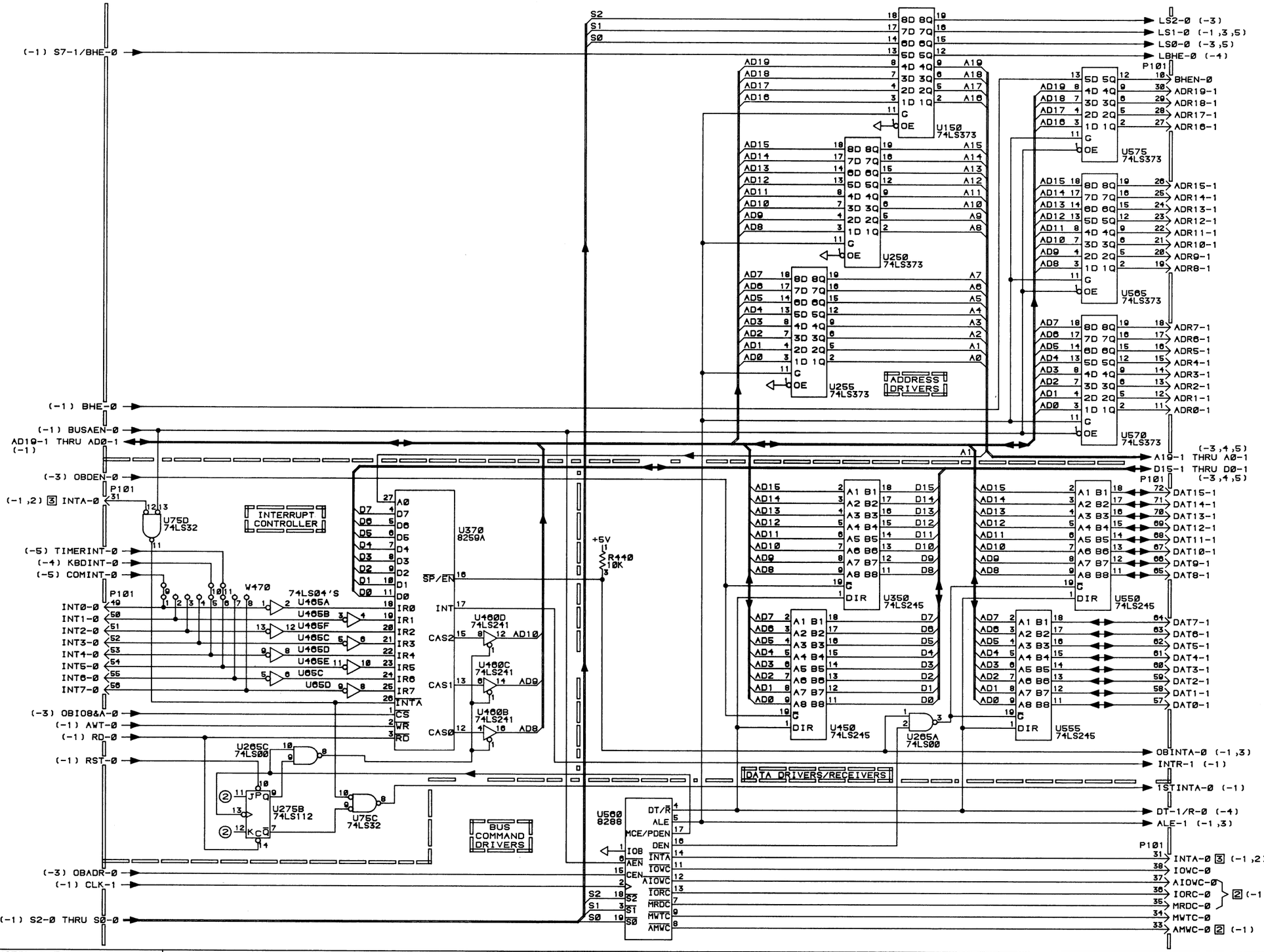
Processor Board (672-1047-00) Component Locations.



INSTRUMENT:	NOTES:		BOARD: 672-1047-00 670-6496-00	ASSEMBLY-SHEET:
4113	☐ INDICATES SHOWN MORE THAN ONCE AND WHERE (-)	12618-S8	PROCESSOR BD	A2A1-1 (1 OF 5)

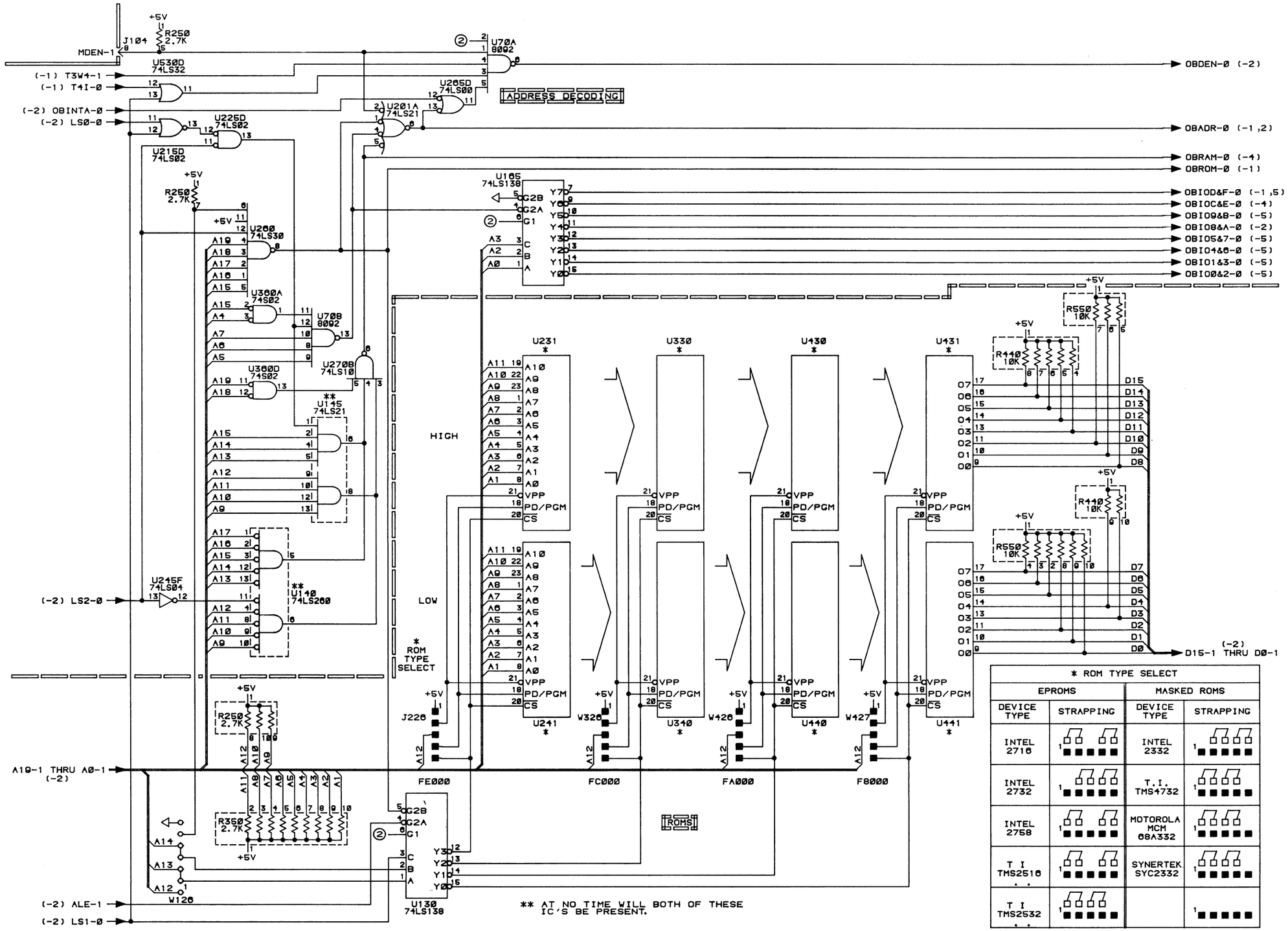
PROCESSOR
672-1047-00

A2A1-1



INSTRUMENT:	NOTES:		BOARD: 672-1047-00 670-6498-00	ASSEMBLY-SHEET:
4113	☐ INDICATES SHOWN MORE THAN ONCE AND WHERE (-)	12618-S9	PROCESSOR BD.	A2A1-2 (2 OF 5)

PROCESSOR 672-1047-00 A2A1-2

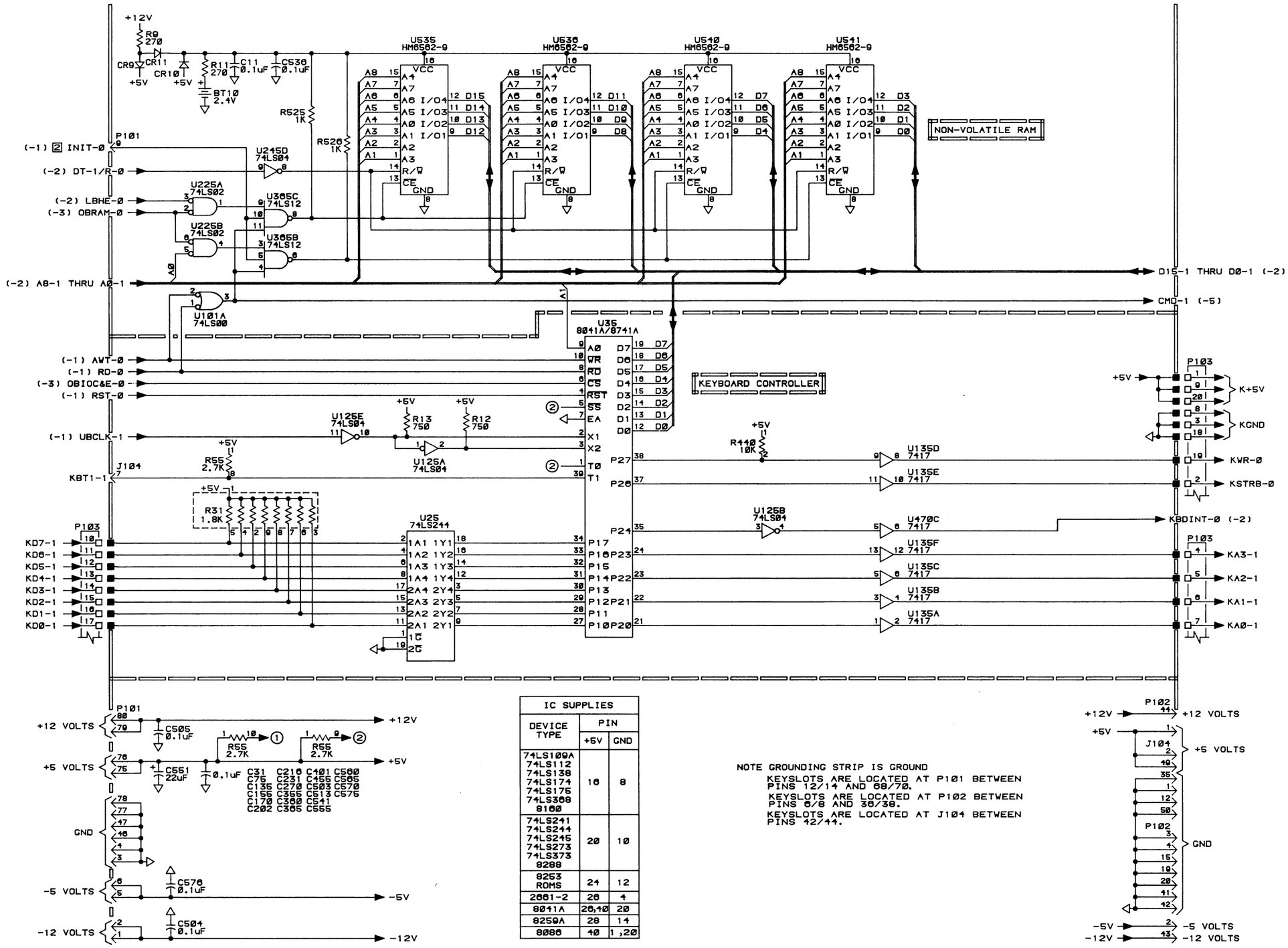


* ROM TYPE SELECT

EPROMS		MASKED ROMS	
DEVICE TYPE	STRAPPING	DEVICE TYPE	STRAPPING
INTEL 2716		INTEL 2332	
INTEL 2732		T.I. TMS4732	
INTEL 2758		MOTOROLA MCM 68A332	
T I TMS2516		SYNERTEK SYC2332	
T I TMS2532			

INSTRUMENT:	NOTES:	BOARD: 672-1047-00 870-6496-00	ASSEMBLY-SHEET:
4113	12618-S10	PROCESSOR BD.	A2A1-3 (3 OF 5)

PROCESSOR 672-1047-00 A2A1-3



IC SUPPLIES		
DEVICE TYPE	PIN	
	+5V	GND
74LS109A 74LS112 74LS138 74LS174 74LS175 74LS368 8160	16	8
74LS241 74LS244 74LS245 74LS273 74LS373 8288	20	10
8253 ROMS	24	12
2661-2	26	4
8041A	26,40	20
8259A	28	14
8086	40	1,20

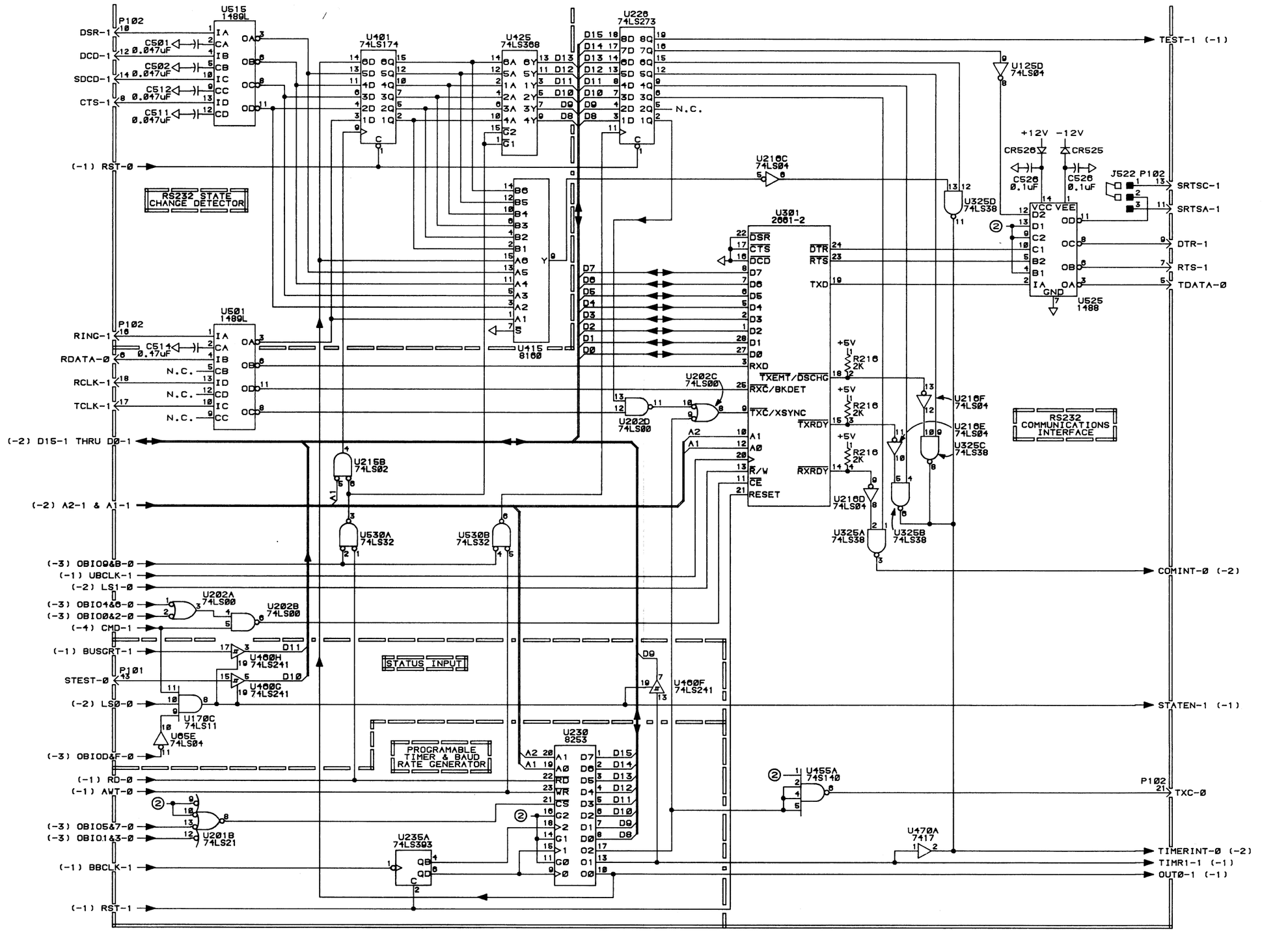
NOTE GROUNDING STRIP IS GROUND

KEYSLOTS ARE LOCATED AT P101 BETWEEN PINS 12/14 AND 68/70.

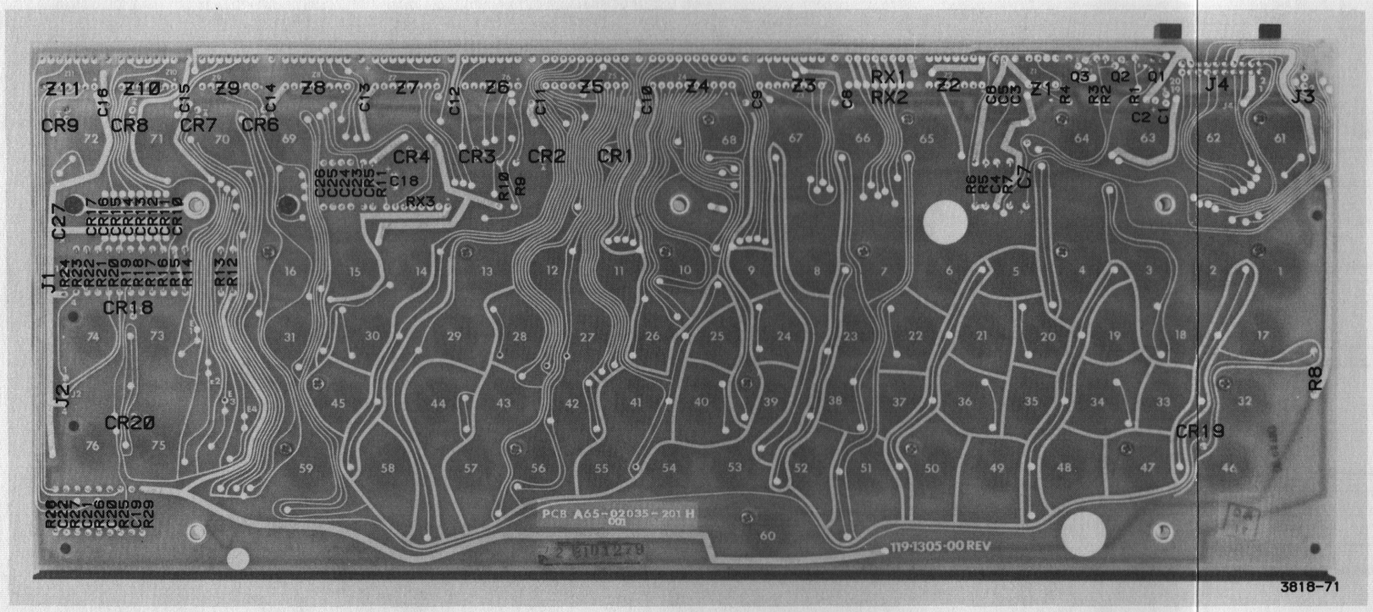
KEYSLOTS ARE LOCATED AT P102 BETWEEN PINS 6/8 AND 36/38.

KEYSLOTS ARE LOCATED AT J104 BETWEEN PINS 42/44.

INSTRUMENT:	NOTES:		BOARD: 672-1047-00 670-6496-00	ASSEMBLY-SHEET:
4113	☐ INDICATES SHOWN MORE THAN ONCE AND WHERE (-)	12618-S11	PROCESSOR BD.	A2A1-4 (4 OF 5)



INSTRUMENT:	NOTES:	BOARD: 672-1047-00 670-6496-00	ASSEMBLY-SHEET:
4113	12618-S12	PROCESSOR BD.	A2A1-5 (5 OF 5)



Keyboard (119-1400-00) Component Locations.

IC SUPPLIES						
DEVICE TYPE	PIN					
	+5V	+5V1	+5V2	GND	GND1	GND2
NE555	8	–	–	1	–	–
7406 74LS08	14	–	–	7	–	–
74LS14	–	–	14	–	–	7
MC14093B	–	14	–	–	7	–
74LS175 74LS259	16	–	–	8	–	–
22-000XX	20	–	–	10	–	–

DECODER CUT STRAP INFORMATION		
FOR KEYBOARD	OPTION NUMBER	OPEN CUT STRAP
U.K.	4A	W4
SWEDISH	4C	W2
APL	4E	W1
DAN/NOR	4F	W2 & W3

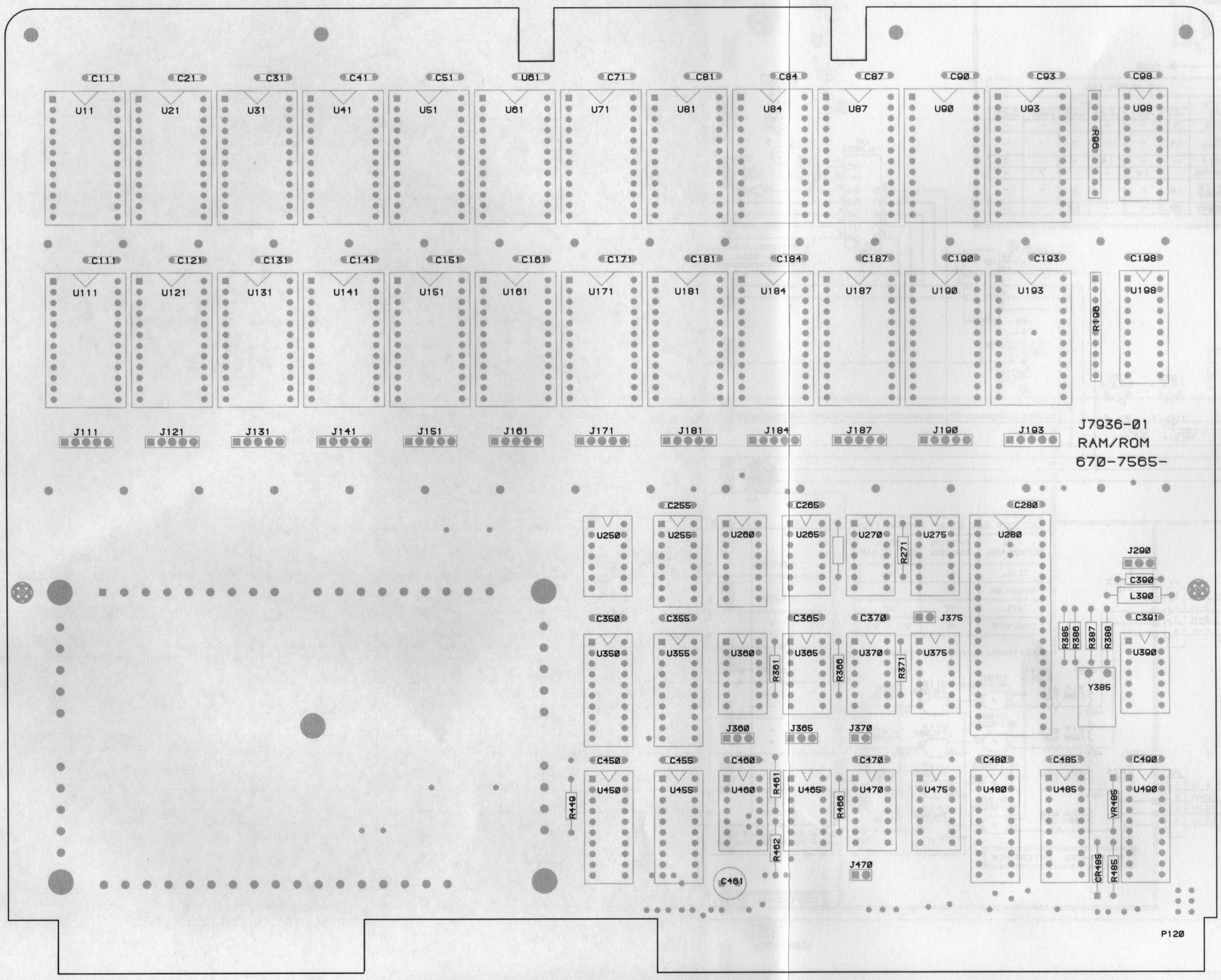
SF = SPL. FUNCTION
UD = USER DEFINABLE

NOTE: DEPRESSING A KEYBOARD SWITCH CREATES A CAPACITIVE COUPLING.

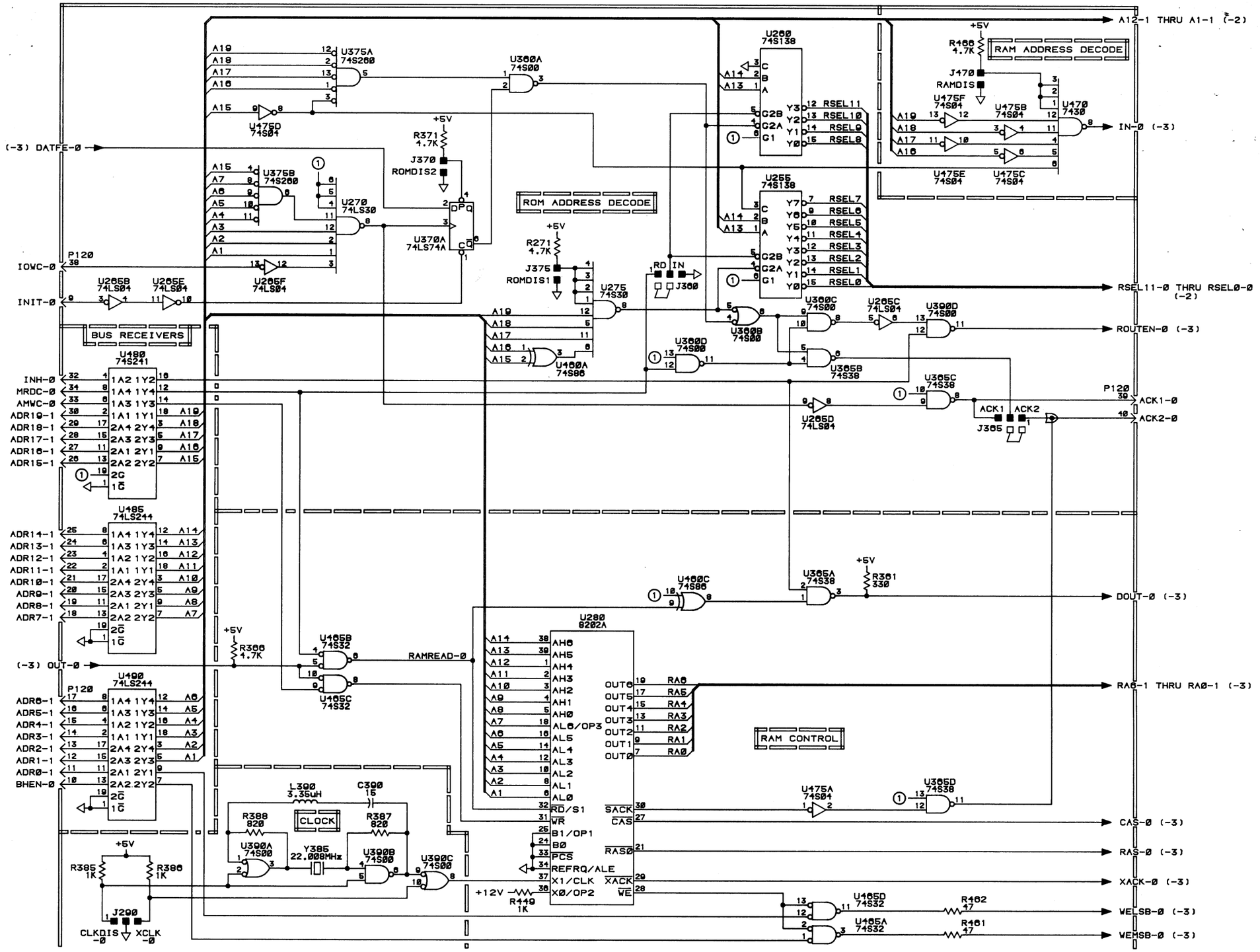
KEYTRONIC CORP.

INSTRUMENT:	NOTES:	BOARD:	ASSEMBLY-SHEET:
119-1400-00 (FOR USE WITH 4113)	12618-S13	KEYBOARD	A3-1 (1 OF 1)

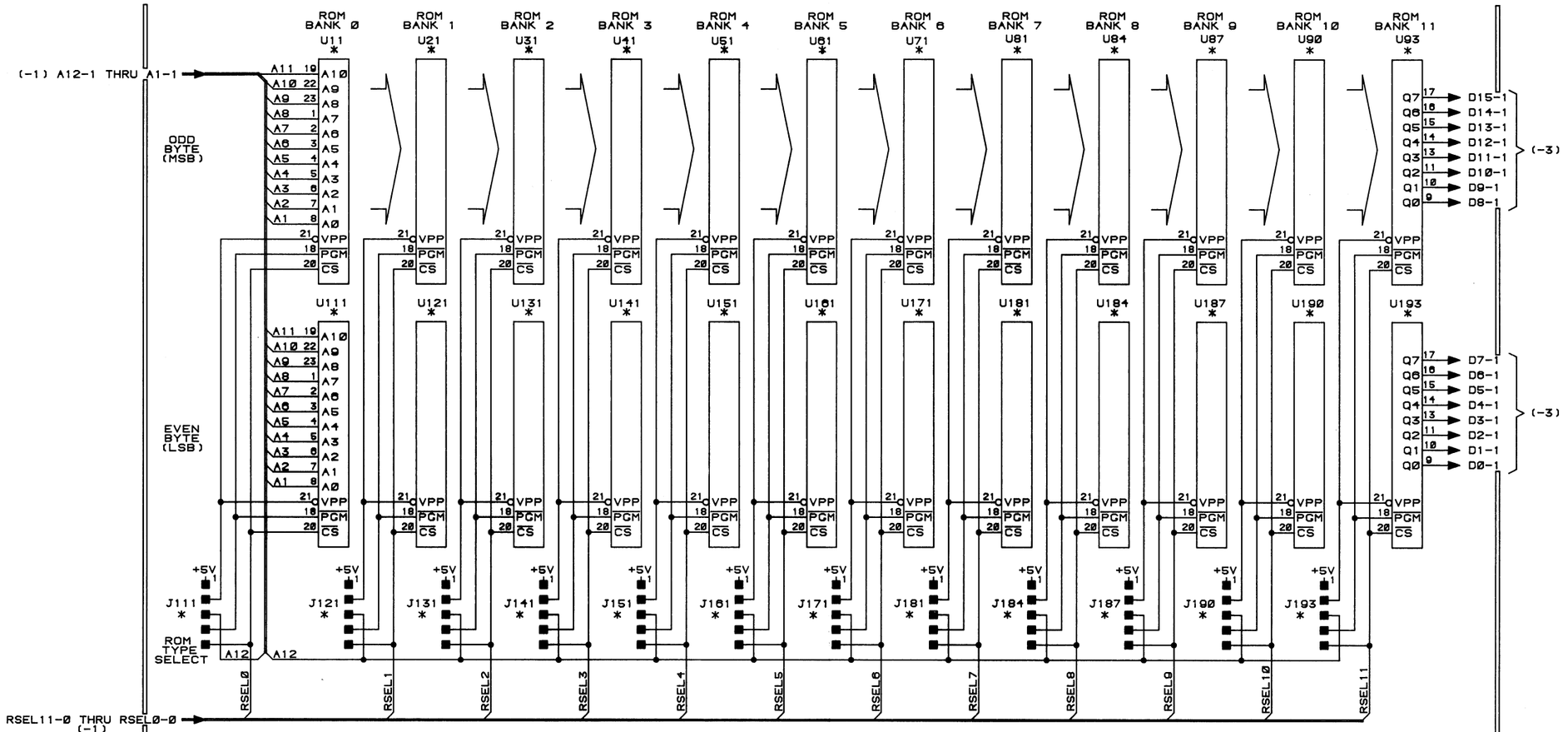
KEYBOARD 119-1400-00 A3-1



RAM/ROM Board (672-1045-00) Component Locations.

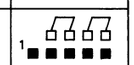
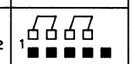
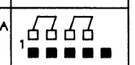
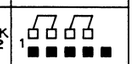
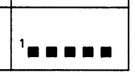


INSTRUMENT:	NOTES:	BOARD: 672-1045-00, 670-7565-00	ASSEMBLY-SHEET:
4113	12618-S14	RAM/ROM BOARD	A4A1-1 (1 OF 3)

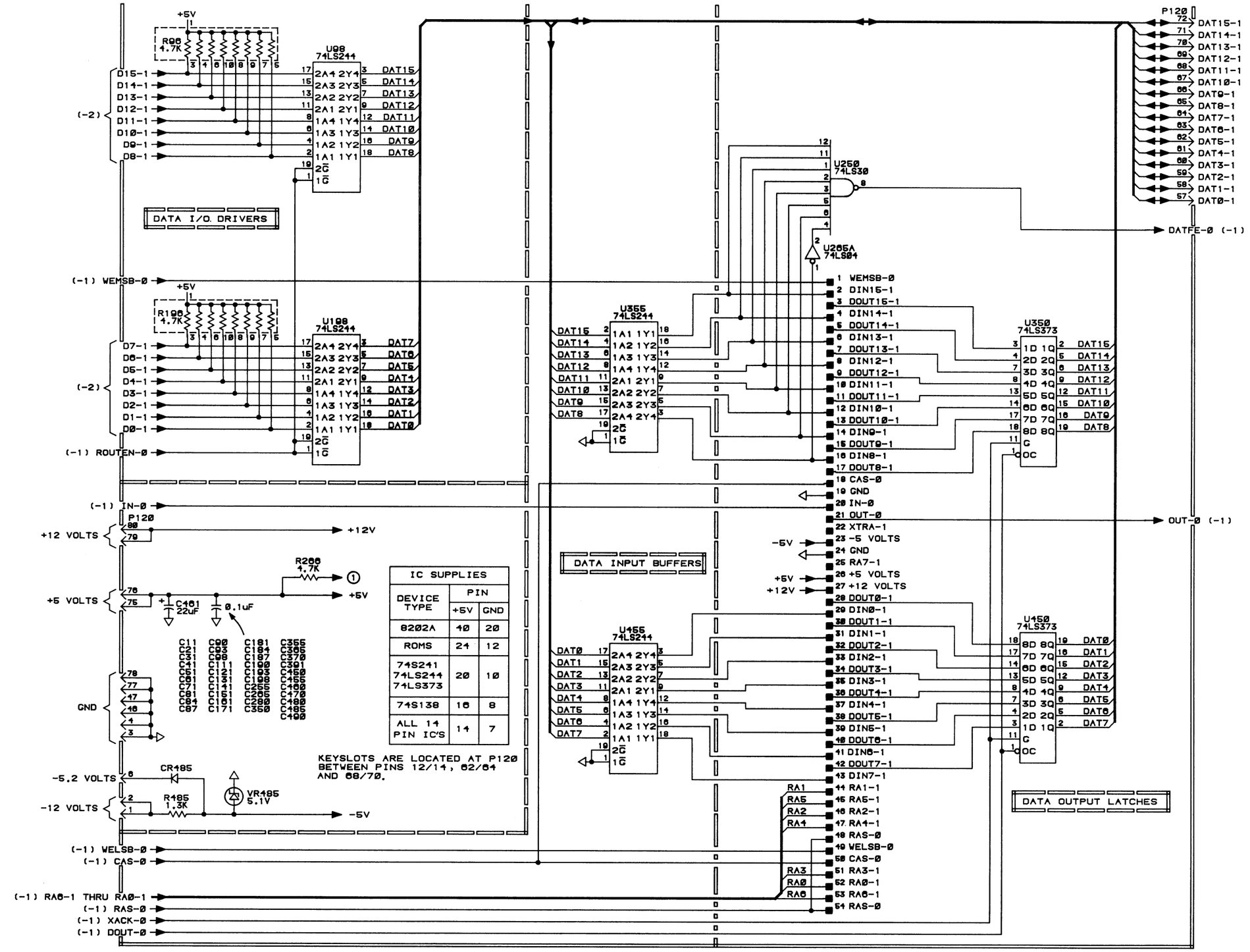


RAM/ROM ADDRESSES	
RAM	00000-07FFF
PAGED ADDRESSING SPACE (PAGE FE)	
ROM BANK 11	0E000-0FFFF
ROM BANK 10	0C000-0DFFF
ROM BANK 9	0A000-0BFFF
ROM BANK 8	08000-09FFF
NORMAL ADDRESSING SPACE	
ROM BANK 7	F6000-F7FFF
ROM BANK 6	F4000-F5FFF
ROM BANK 5	F2000-F3FFF
ROM BANK 4	F0000-F1FFF
ROM BANK 3	EE000-EFFFF
ROM BANK 2	EC000-EDFFF
ROM BANK 1	EA000-EBFFF
ROM BANK 0	E8000-E9FFF

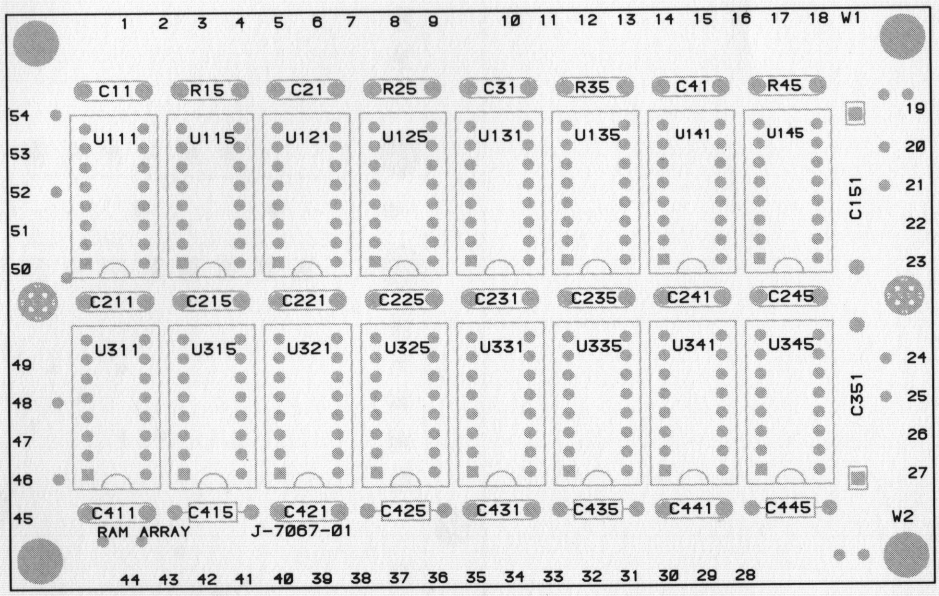
ROMS

* ROM TYPE SELECT			
EPROMS		MASKED ROMS	
DEVICE TYPE	STRAPPING	DEVICE TYPE	STRAPPING
INTEL 2716		INTEL 2332	
INTEL 2732		T.I. TMS4732	
INTEL 2758		MOTOROLA MCM 68A332	
T.I. TMS2516		SYNERTEK SYC2332	
T.I. TMS2532			

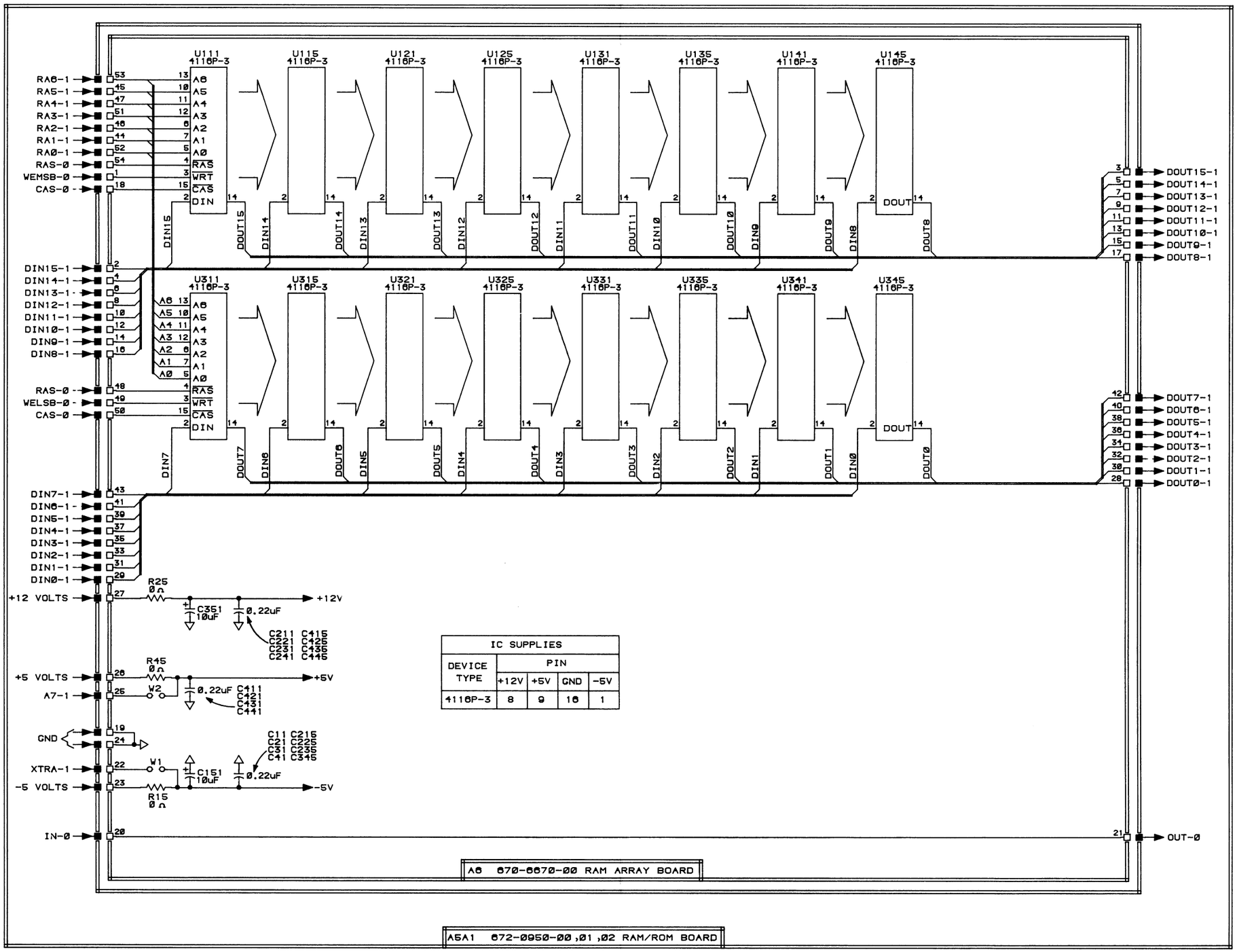
INSTRUMENT:	NOTES:	BOARD: 672-1045-00, 670-7565-00	ASSEMBLY-SHEET:
4113	12618-S15	RAM/ROM BOARD	A4A1-2 (2 OF 3)



INSTRUMENT:	NOTES:	BOARD: 672-1045-00, 670-7585-00	ASSEMBLY-SHEET:
4113	12618-S16	RAM/ROM BOARD	A4A1-3 (3 OF 3)



RAM Array Board (670-6670-00) Component Locations

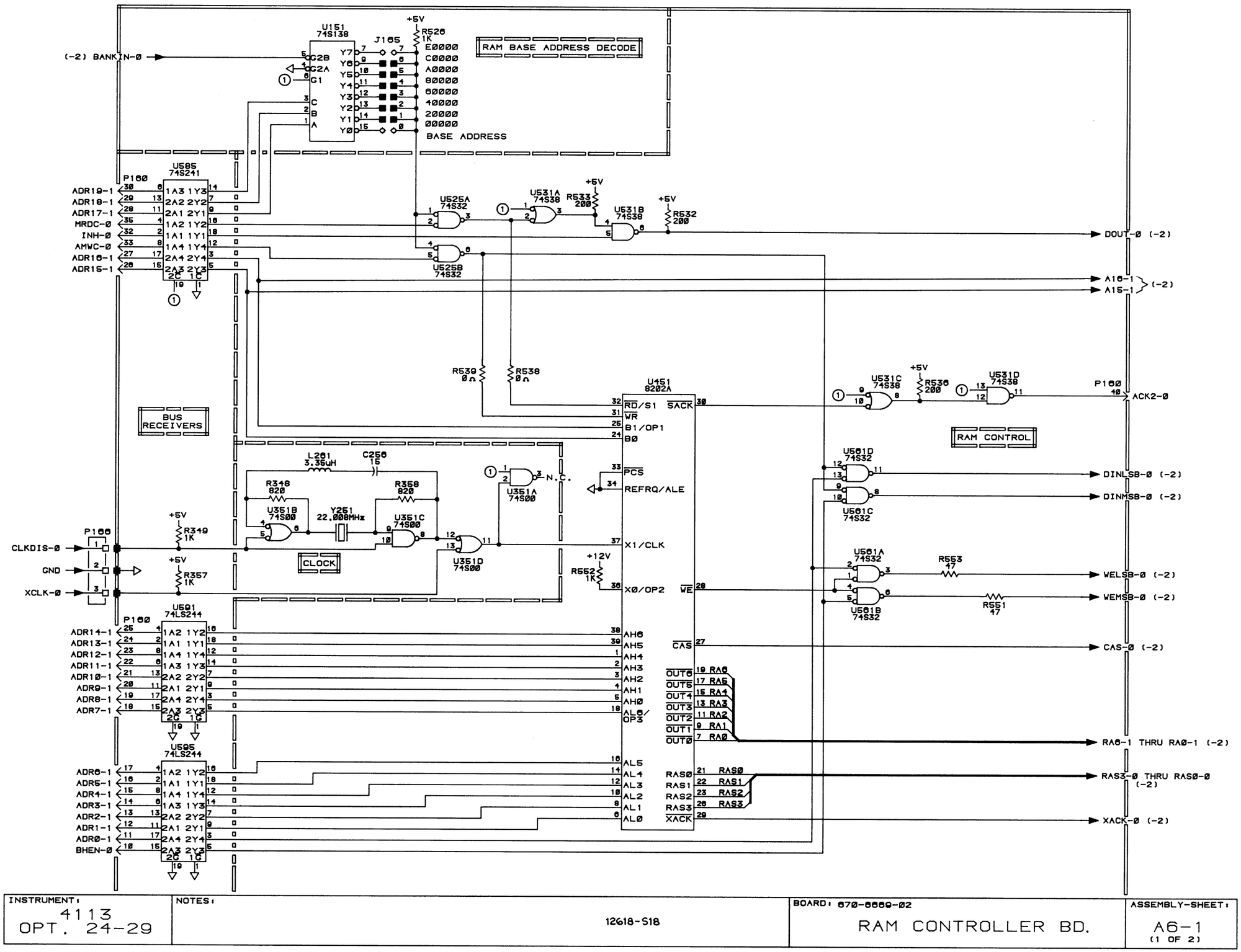


IC SUPPLIES				
DEVICE TYPE	PIN			
	+12V	+5V	GND	-5V
4116P-3	8	9	16	1

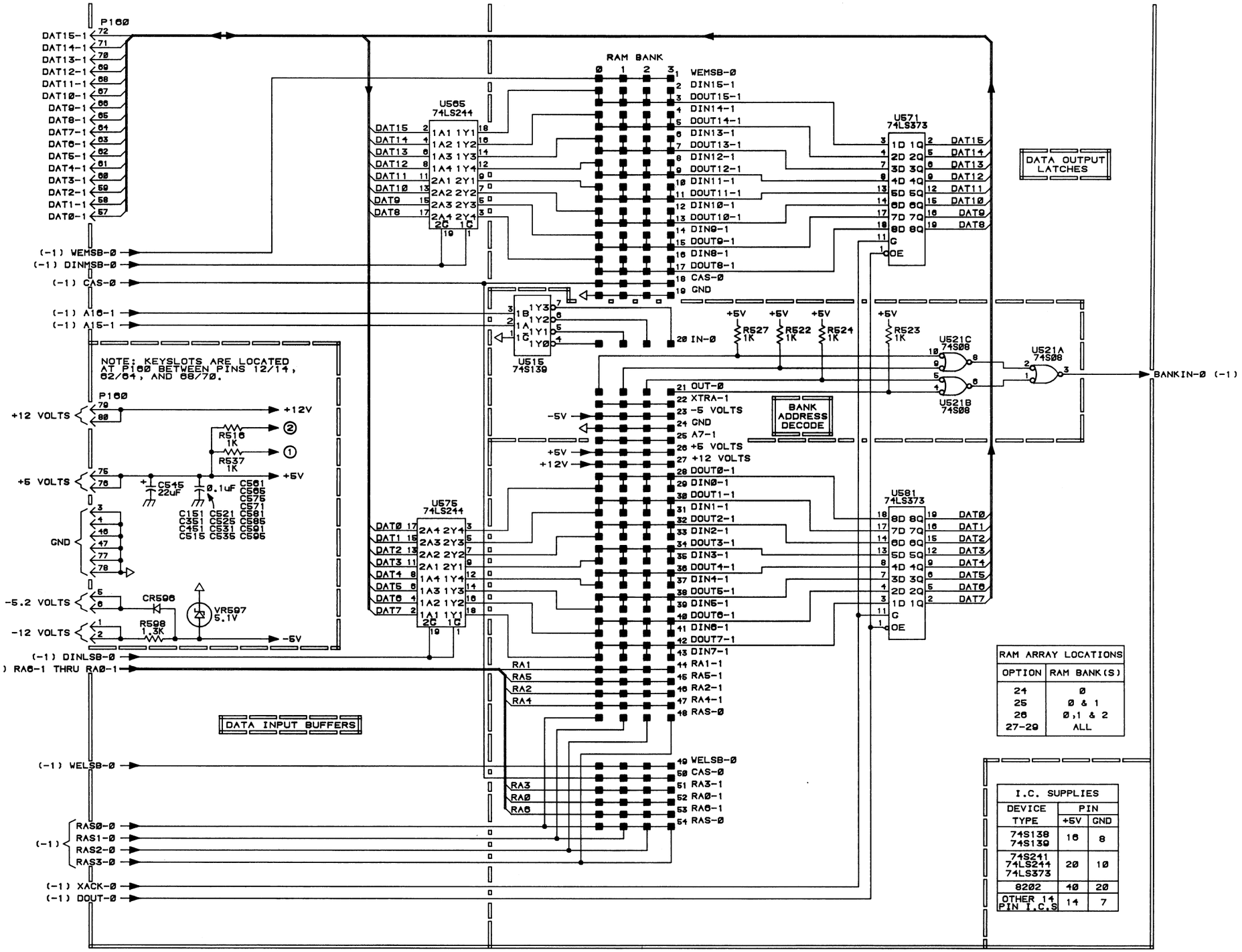
A6 670-6670-00 RAM ARRAY BOARD

A5A1 672-0950-00,01,02 RAM/ROM BOARD

INSTRUMENT:	NOTES:	BOARD: 670-6670-00	ASSEMBLY-SHEET:
4113	12618-S17	RAM ARRAY BD.	A5-1 (1 OF 1)



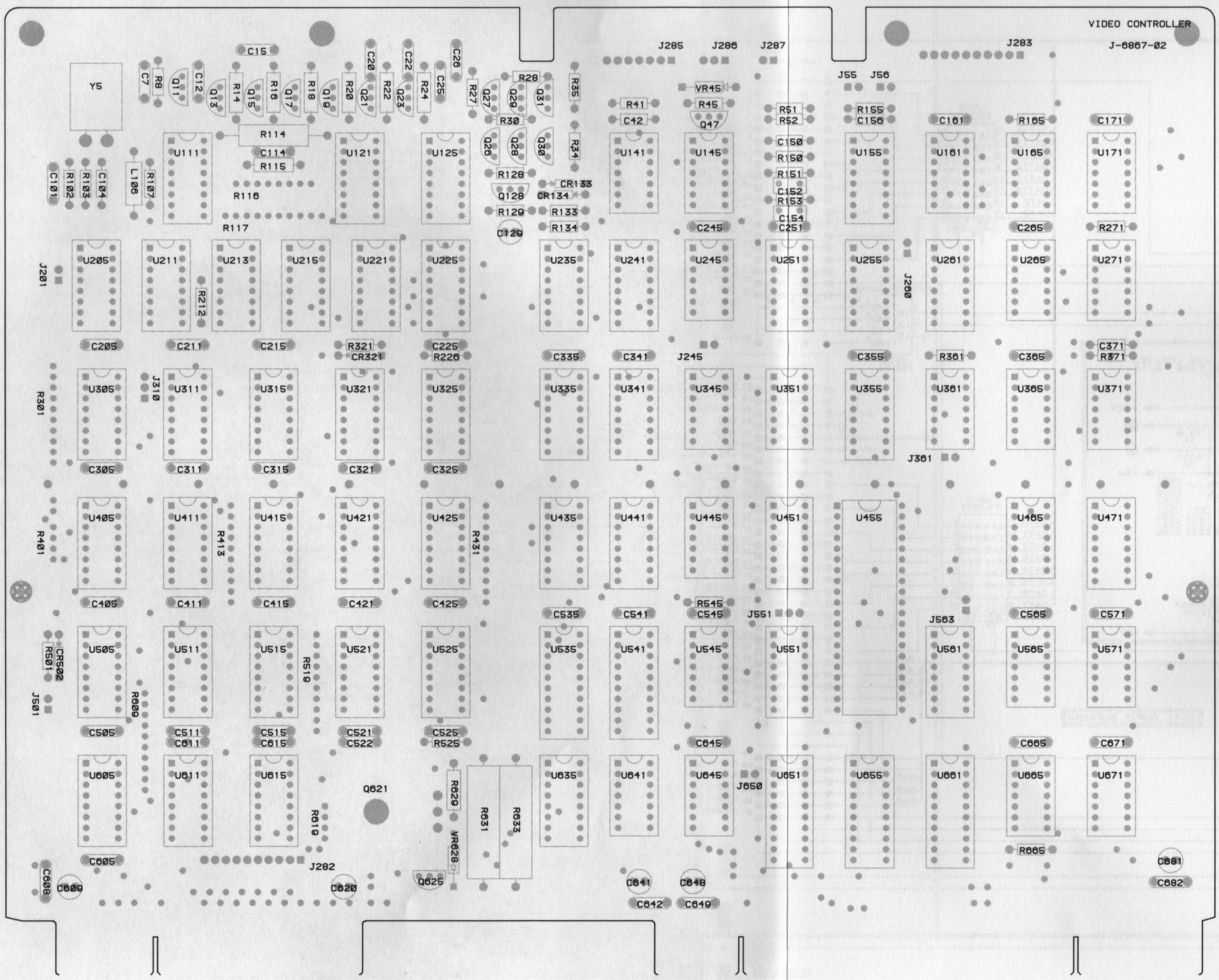
INSTRUMENT:	NOTES:	BOARD: 670-8669-02	ASSEMBLY-SHEET:
4113 OPT. 24-29	12618-S18	RAM CONTROLLER BD.	A6-1 (1 OF 2)



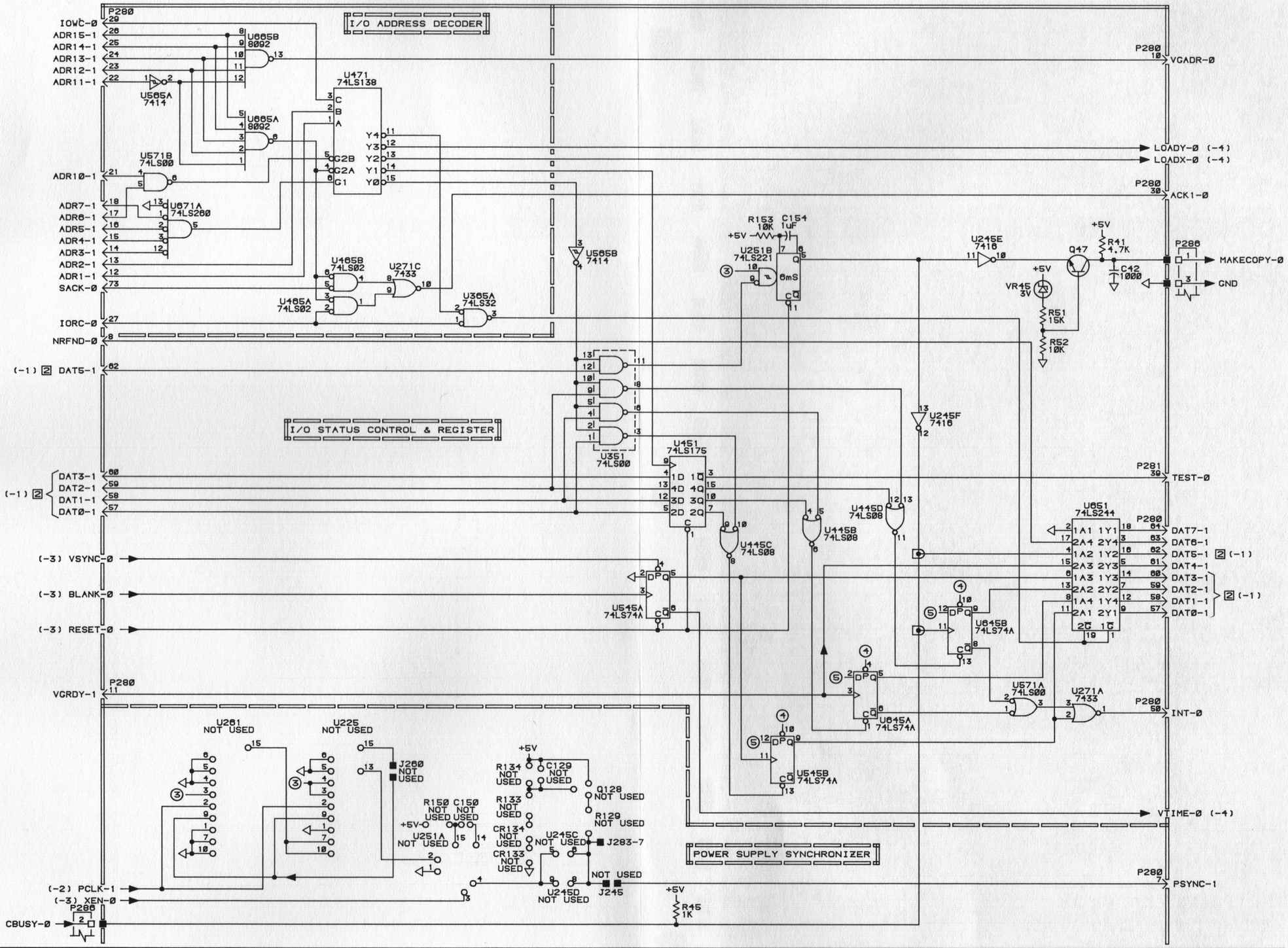
RAM ARRAY LOCATIONS	
OPTION	RAM BANK(S)
24	0
25	0 & 1
26	0,1 & 2
27-29	ALL

I.C. SUPPLIES		
DEVICE TYPE	PIN +5V	PIN GND
74S138 74S139	16	8
74S241 74LS244 74LS373	20	10
8202	40	20
OTHER 14 PIN I.C.S	14	7

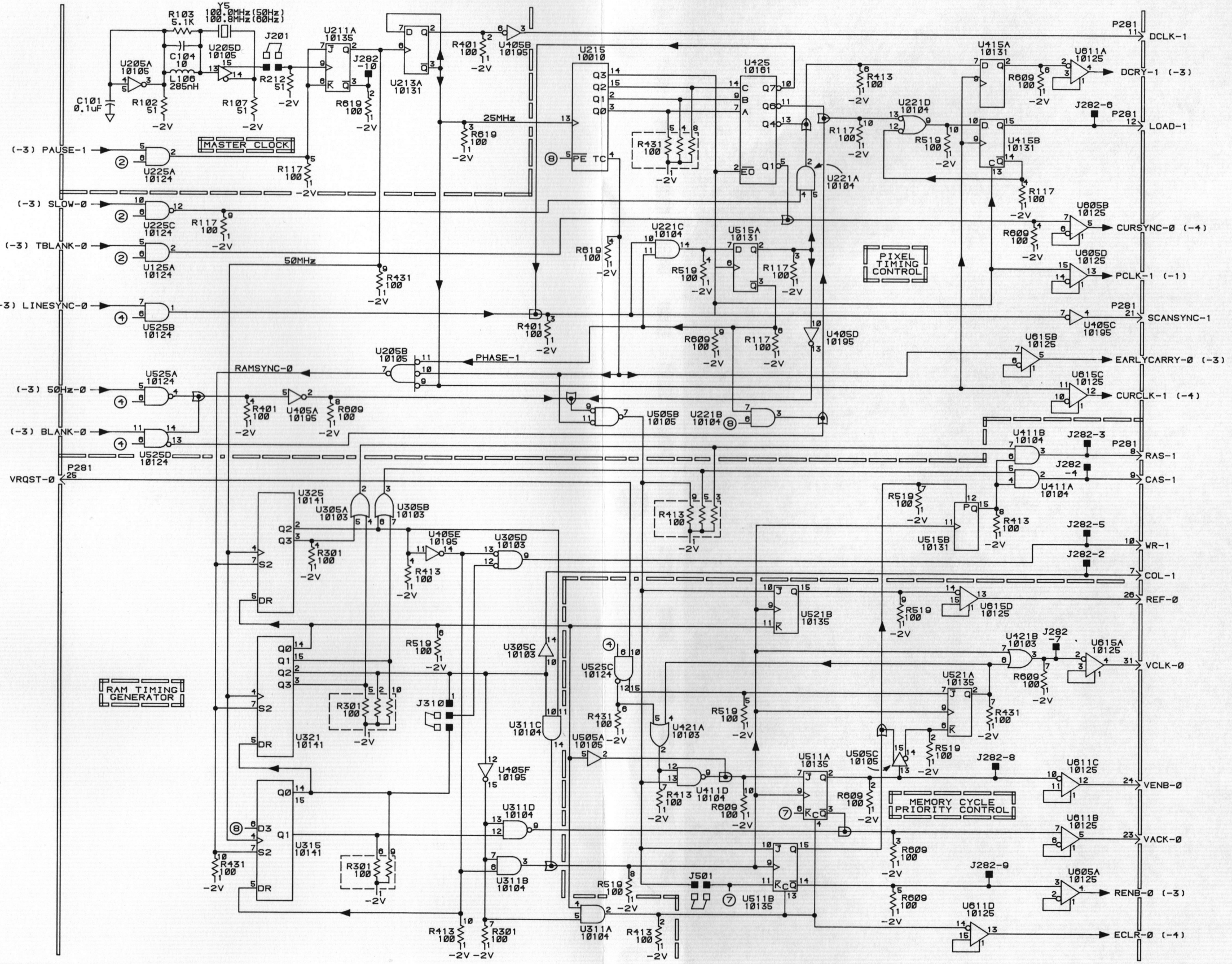
INSTRUMENT:	NOTES:	BOARD: 670-6669-02	ASSEMBLY-SHEET:
4113 OPT. 24-29	12618-S19	RAM CONTROLLER BD.	A6-2 (2 OF 2)



Video Controller Board (672-1003-00) Component Locations, 672-1004-02.

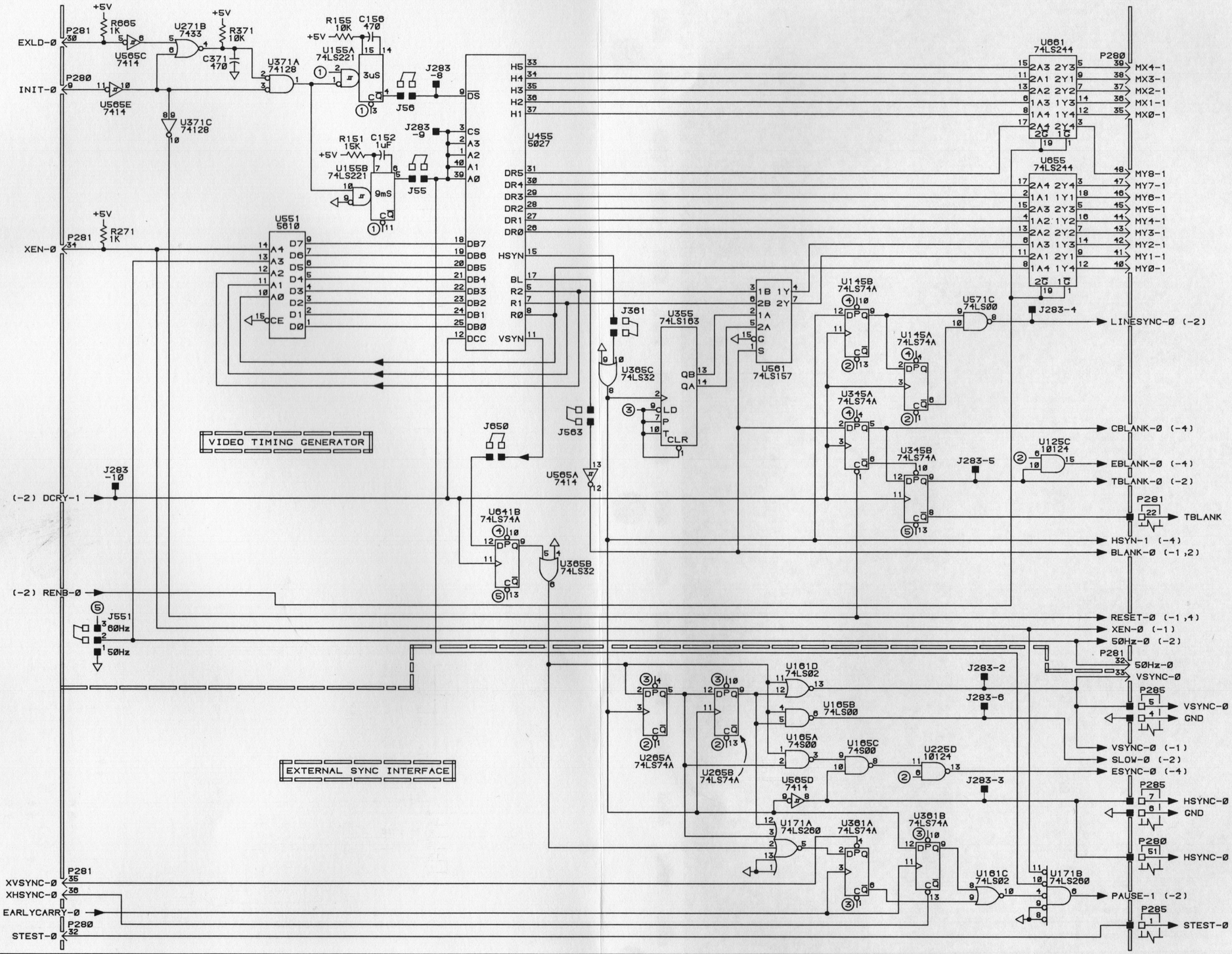


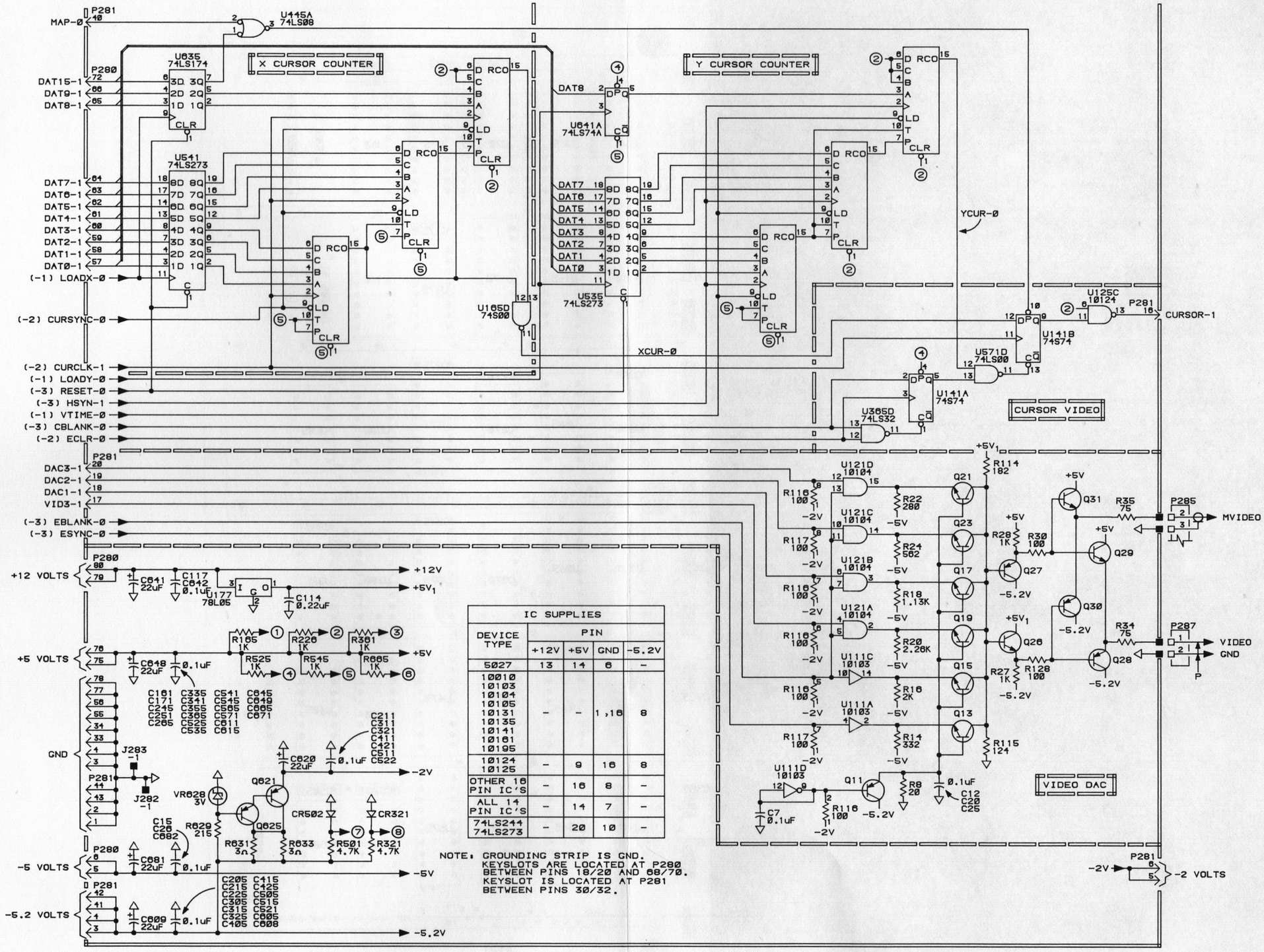
INSTRUMENT:	NOTES:		BOARD: 672-1003-00/672-1004-02, 670-6475-02	ASSEMBLY-SHEET:
4113	☐ INDICATES SHOWN MORE THAN ONCE AND WHERE (-)	12618-S20	VIDEO CONTROLLER BD.	A7A1-1 (1 OF 4)



INSTRUMENT:	NOTES:	BOARD: 672-1003-00/672-1004-02 , 670-6475-02	ASSEMBLY-SHEET:
4113	12618-S21	VIDEO CONTROLLER BD.	A7A1-2 (2 OF 4)

VIDEO CONTROLLER
672-1003-00, 672-1004-02 A7A1-2

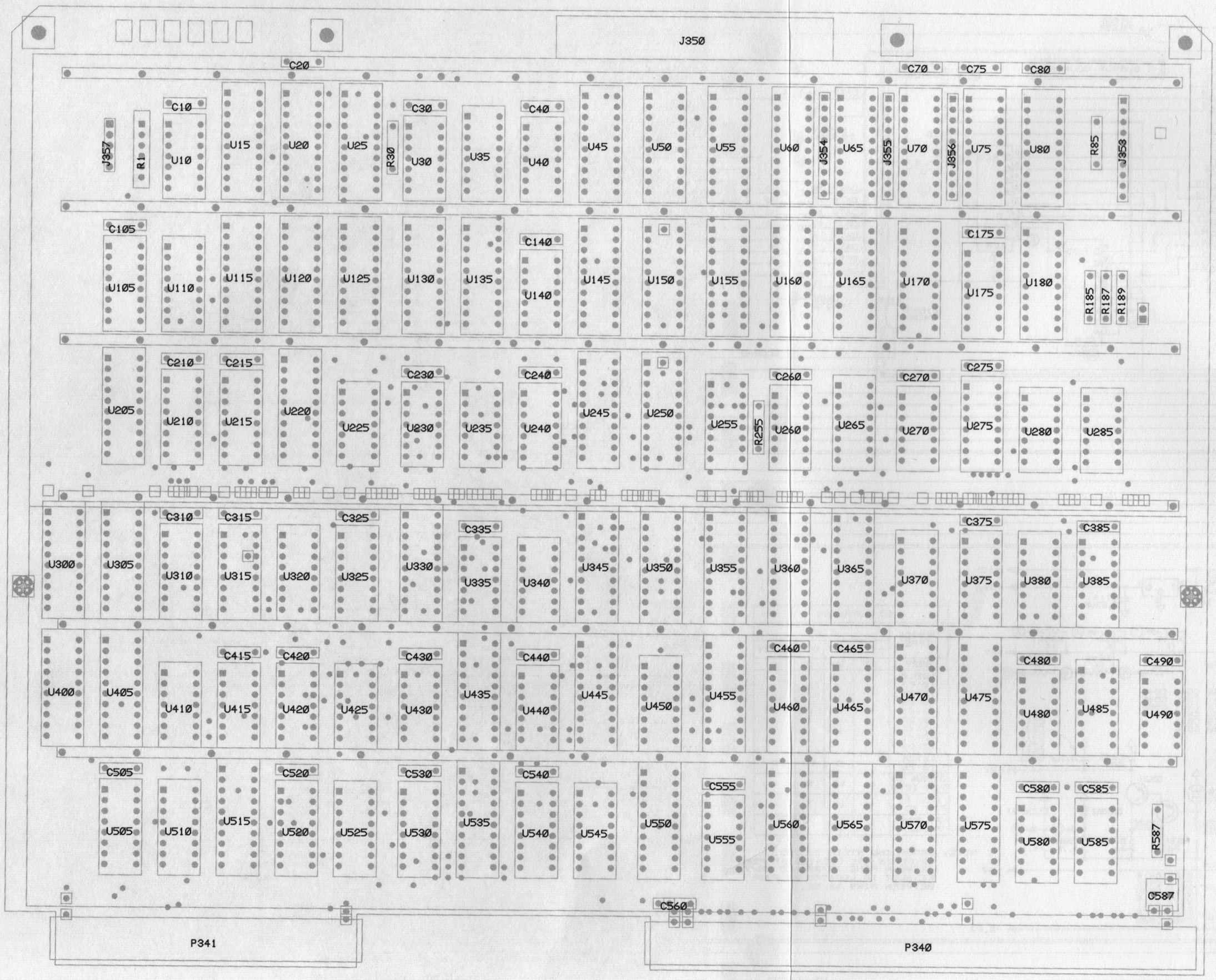

VIDEO TIMING GENERATOR
EXTERNAL SYNC INTERFACE
EXLD-0
INIT-0
XEN-0
(-2) DCRY-1
(-2) RENB-0
XVSYNC-0
XHSYNC-0
(-2) EARLYCARRY-0
STEST-0
LINESYNC-0 (-2)
CBLANK-0 (-4)
EBLANK-0 (-4)
TBLANK-0 (-2)
TBLANK
HSYN-1 (-4)
BLANK-0 (-1,2)
RESET-0 (-1,4)
XEN-0 (-1)
50Hz-0 (-2)
50Hz-0
VSYNC-0
VSYNC-0 (-1)
SLOW-0 (-2)
ESYNC-0 (-4)
HSYNC-0
PAUSE-1 (-2)
STEST-0
MX4-1
MX3-1
MX2-1
MX1-1
MX0-1
MY8-1
MY7-1
MY6-1
MY5-1
MY4-1
MY3-1
MY2-1
MY1-1
MY0-1
U455 5027
U551 5610
U661 74LS244
U655 74LS244
U355 74LS163
U561 74LS157
U155A 74LS221
U155B 74LS221
U371A 74128
U371C 74128
U271B 7433
U565C 7414
U565E 7414
U565A 7414
U565D 7414
U365C 74LS32
U365B 74LS32
U145B 74LS74A
U145A 74LS74A
U345A 74LS74A
U345B 74LS74A
U641B 74LS74A
U265A 74LS74A
U265B 74LS74A
U361A 74LS74A
U361B 74LS74A
U571C 74LS00
U165B 74LS00
U165A 74S00
U165C 74S00
U161D 74LS02
U161C 74LS02
U171A 74LS260
U171B 74LS260
U225D 10124
U125C 10124
R665 1K
R371 10K
C371 470
R155 10K
C156 470
R151 15K
C152 1uF
R271 1K
3uS
9mS
60Hz
50Hz
J551
J650
J563
J361
J55
J56
J283-4
J283-5
J283-2
J283-6
J283-3
P280
P281
P285
INSTRUMENT: 4113
NOTES:
12618-S22
BOARD: 672-1003-00/672-1004-02, 670-6475-02
VIDEO CONTROLLER BD.
ASSEMBLY-SHEET: A7A1-3 (3 OF 4)



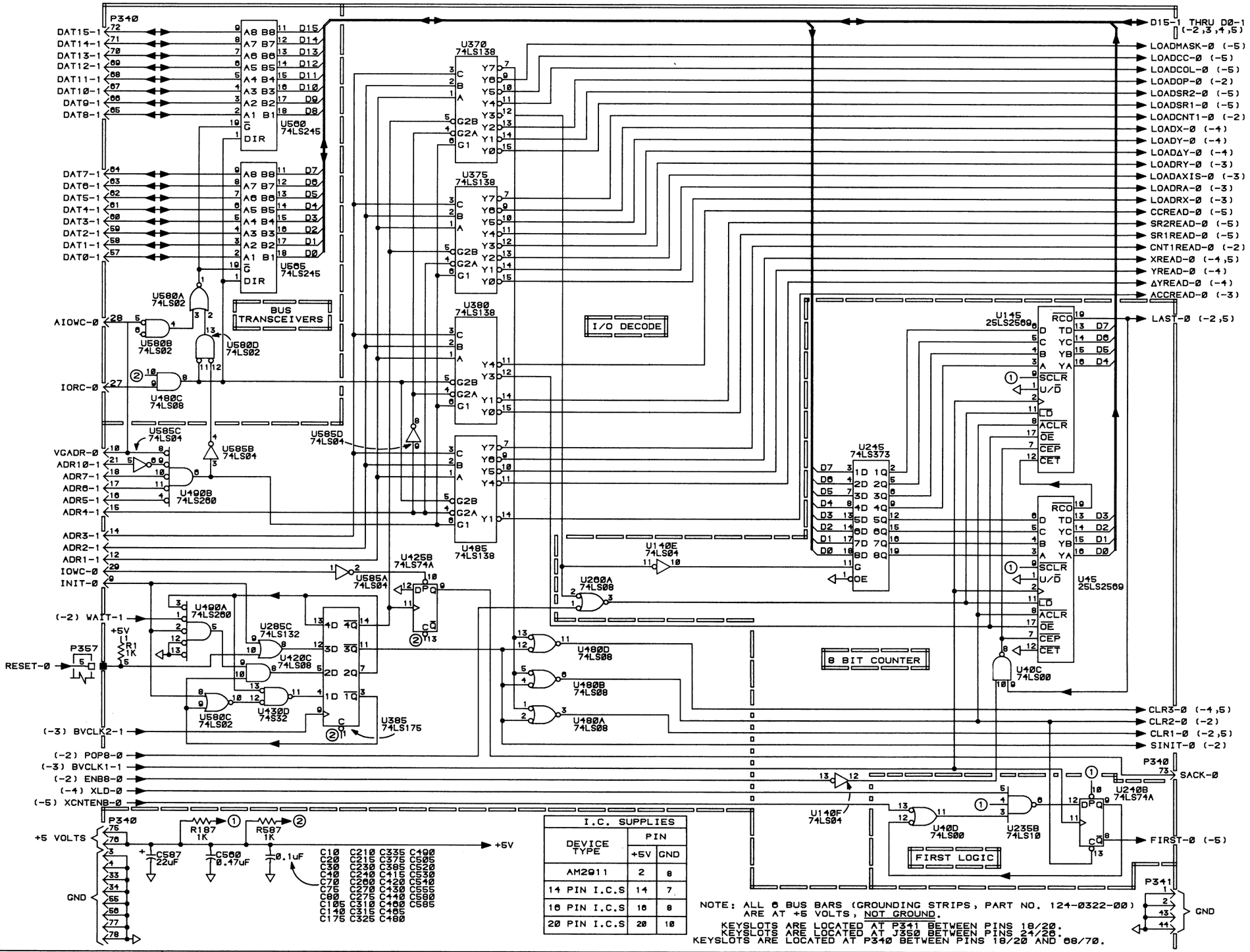
IC SUPPLIES				
DEVICE TYPE	PIN			
	+12V	+5V	GND	-5.2V
5027	13	14	6	-
10010 10103 10104 10105 10131 10135 10141 10161 10195	-	-	1 ,16	8
10124 10125	-	9	16	8
OTHER 16 PIN IC'S	-	16	8	-
ALL 14 PIN IC'S	-	14	7	-
74LS244 74LS273	-	20	10	-

NOTE: GROUNDING STRIP IS GND.
KEYSLOTS ARE LOCATED AT P280 BETWEEN PINS 18/20 AND 68/70.
KEYSLOT IS LOCATED AT P281 BETWEEN PINS 30/32.

INSTRUMENT:	NOTES:	BOARD: 672-1003-00/672-1004-02, 670-6475-02	ASSEMBLY-SHEET:
4113	12618-S23	VIDEO CONTROLLER BD.	A7A1-4 (4 OF 4)



Vector Generator Board (670-6474-02) Component Locations.

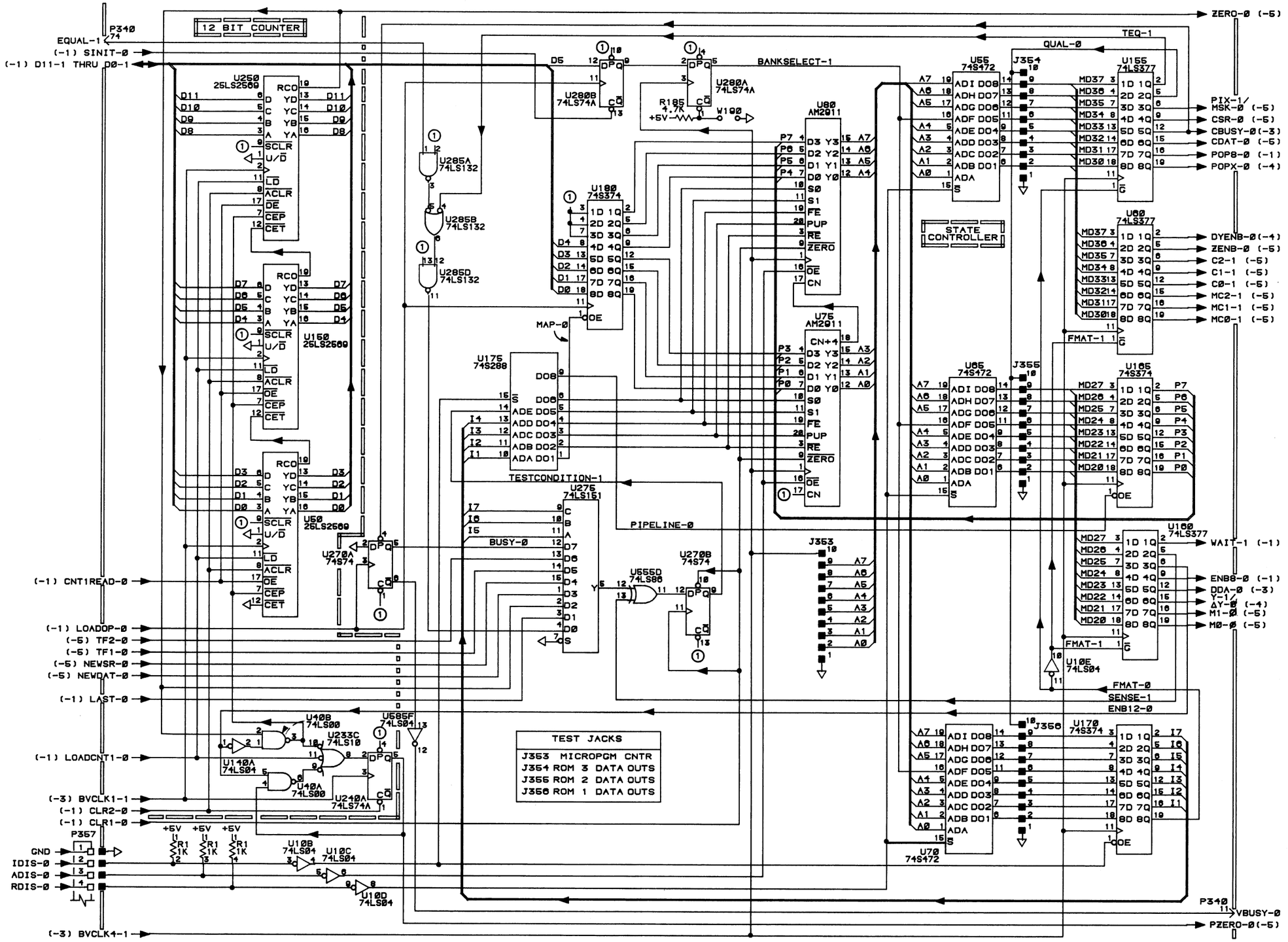


I.C. SUPPLIES		
DEVICE TYPE	PIN +5V	PIN GND
AM2911	2	8
14 PIN I.C.S	14	7
16 PIN I.C.S	16	8
20 PIN I.C.S	20	10

NOTE: ALL 6 BUS BARS (GROUNDING STRIPS, PART NO. 124-0322-00) ARE AT +5 VOLTS, NOT GROUND.

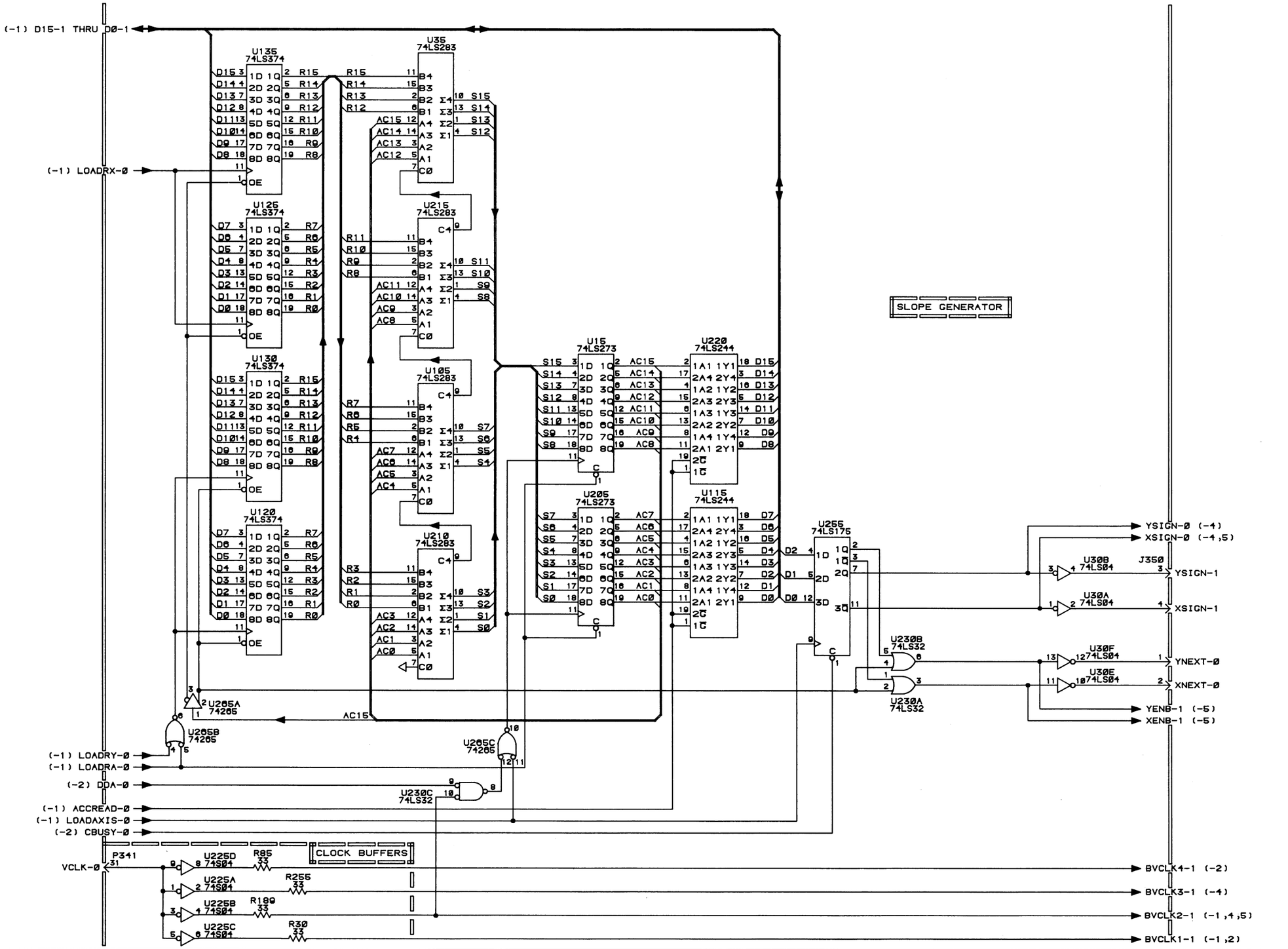
KEYSLOTS ARE LOCATED AT P341 BETWEEN PINS 18/20.
KEYSLOTS ARE LOCATED AT J350 BETWEEN PINS 24/26.
KEYSLOTS ARE LOCATED AT P340 BETWEEN PINS 18/20 AND 68/70.

INSTRUMENT:	NOTES:	BOARD: 670-6474-02	ASSEMBLY-SHEET:
4113	12618-S24	VECTOR GENERATOR BD.	A8-1 (1 OF 5)

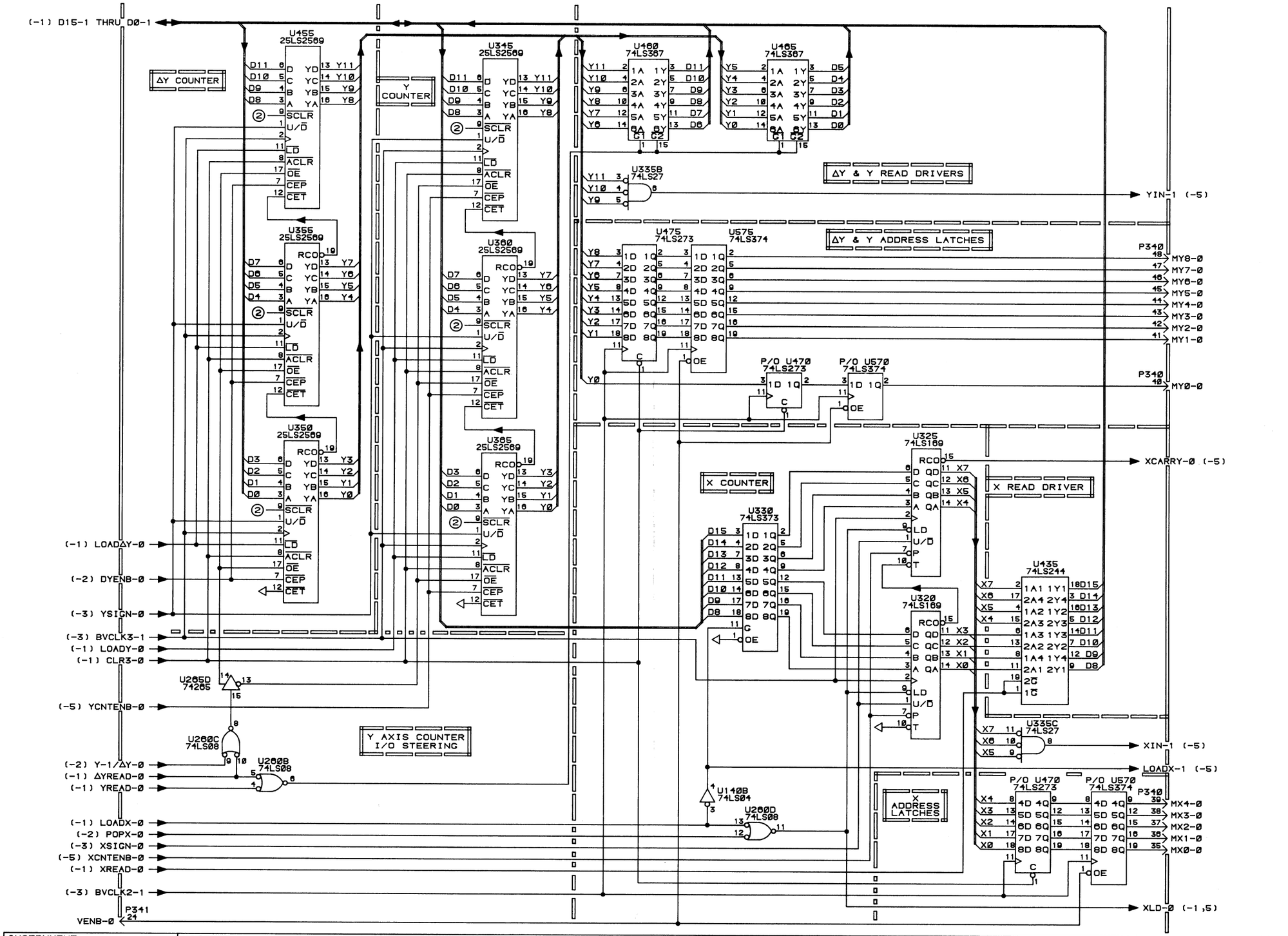


TEST JACKS	
J353	MICROPGM CNTR
J354	ROM 3 DATA OUTS
J355	ROM 2 DATA OUTS
J356	ROM 1 DATA OUTS

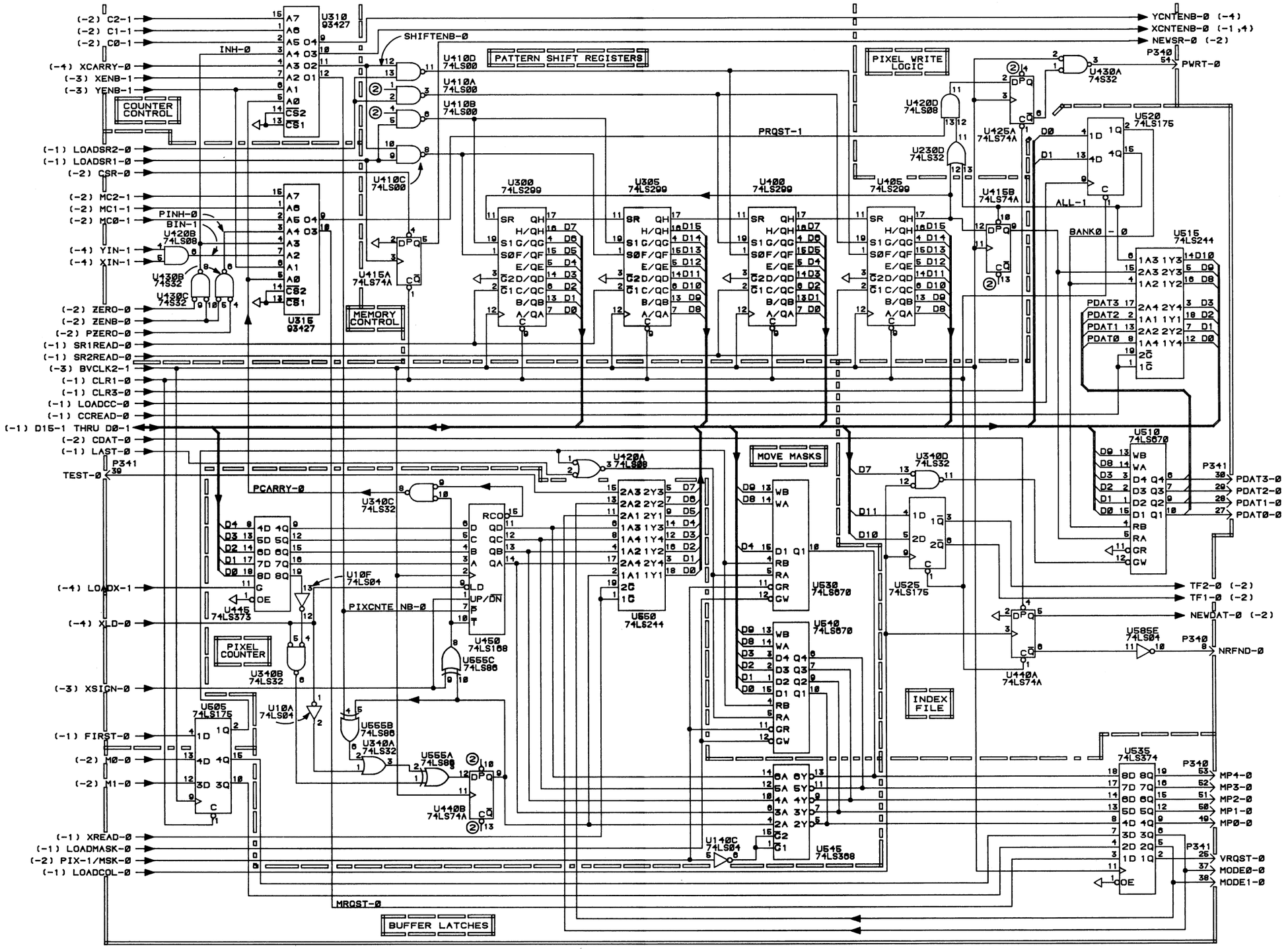
INSTRUMENT:	NOTES:	BOARD: 670-6474-02	ASSEMBLY-SHEET:
4113	12618-S25	VECTOR GENERATOR BD.	A8-2 (2 OF 5)



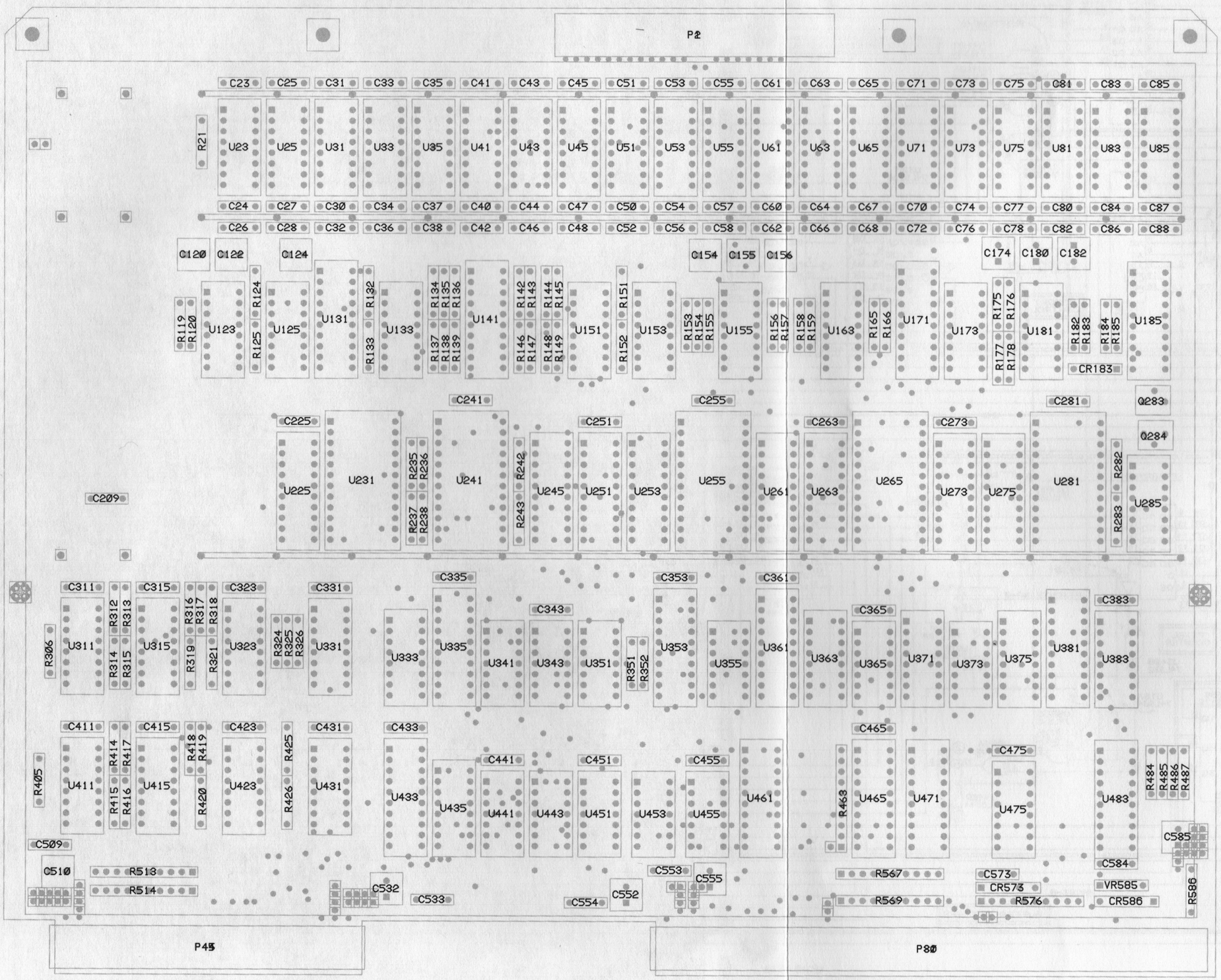
INSTRUMENT:	NOTES:	BOARD: 670-6474-02	ASSEMBLY-SHEET:
4113	12618-S26	VECTOR GENERATOR BD.	A8-3 (3 OF 5)



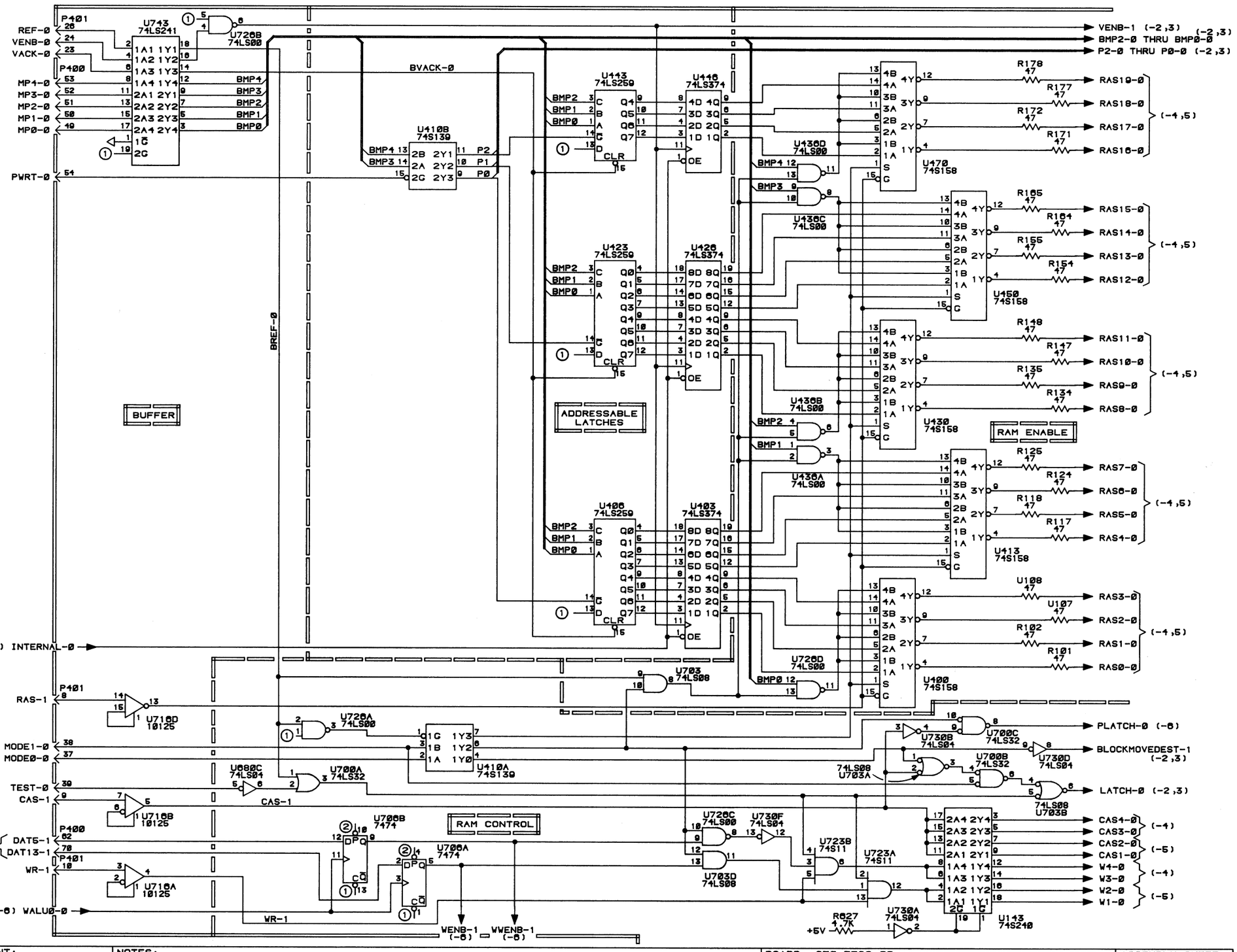
INSTRUMENT:	NOTES:	BOARD: 670-6474-02	ASSEMBLY-SHEET:
4113	12618-S27	VECTOR GENERATOR BD.	A8-4 (4 OF 5)



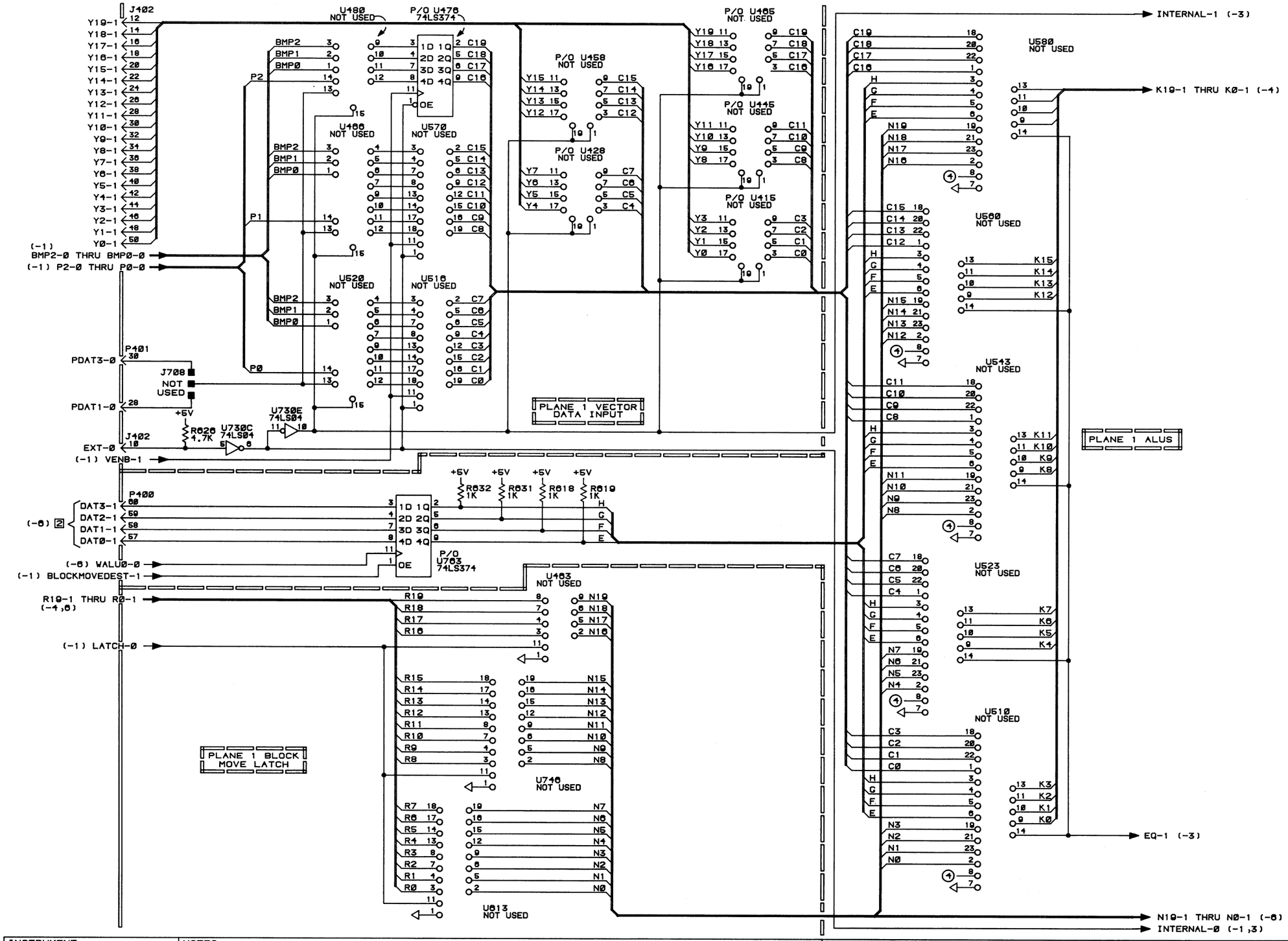
INSTRUMENT:	NOTES:	BOARD: 670-6474-02	ASSEMBLY-SHEET:
4113	12618-528	VECTOR GENERATOR BD.	A8-5 (5 OF 5)



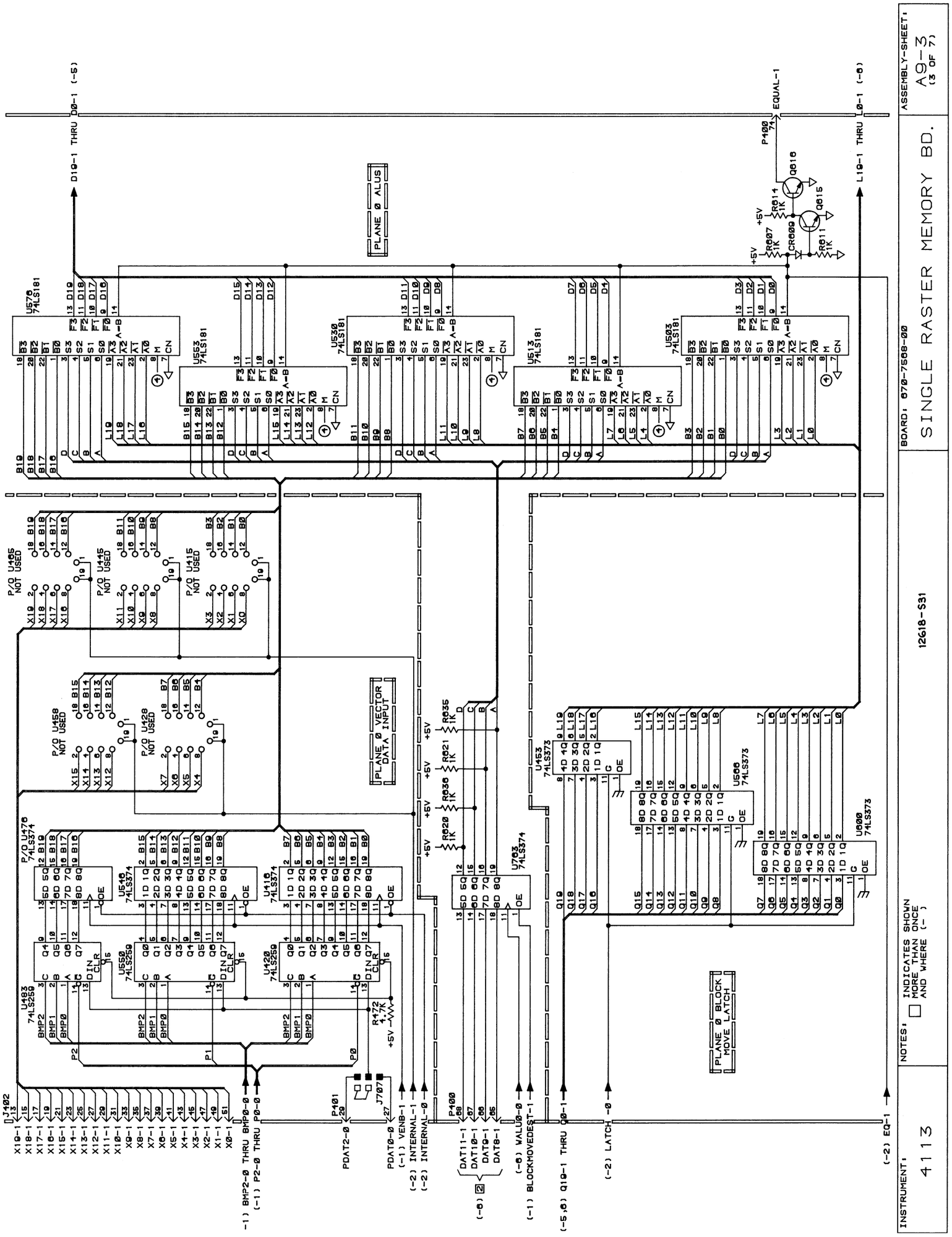
Single Raster Memory Board (670-7568-00) Component Locations.

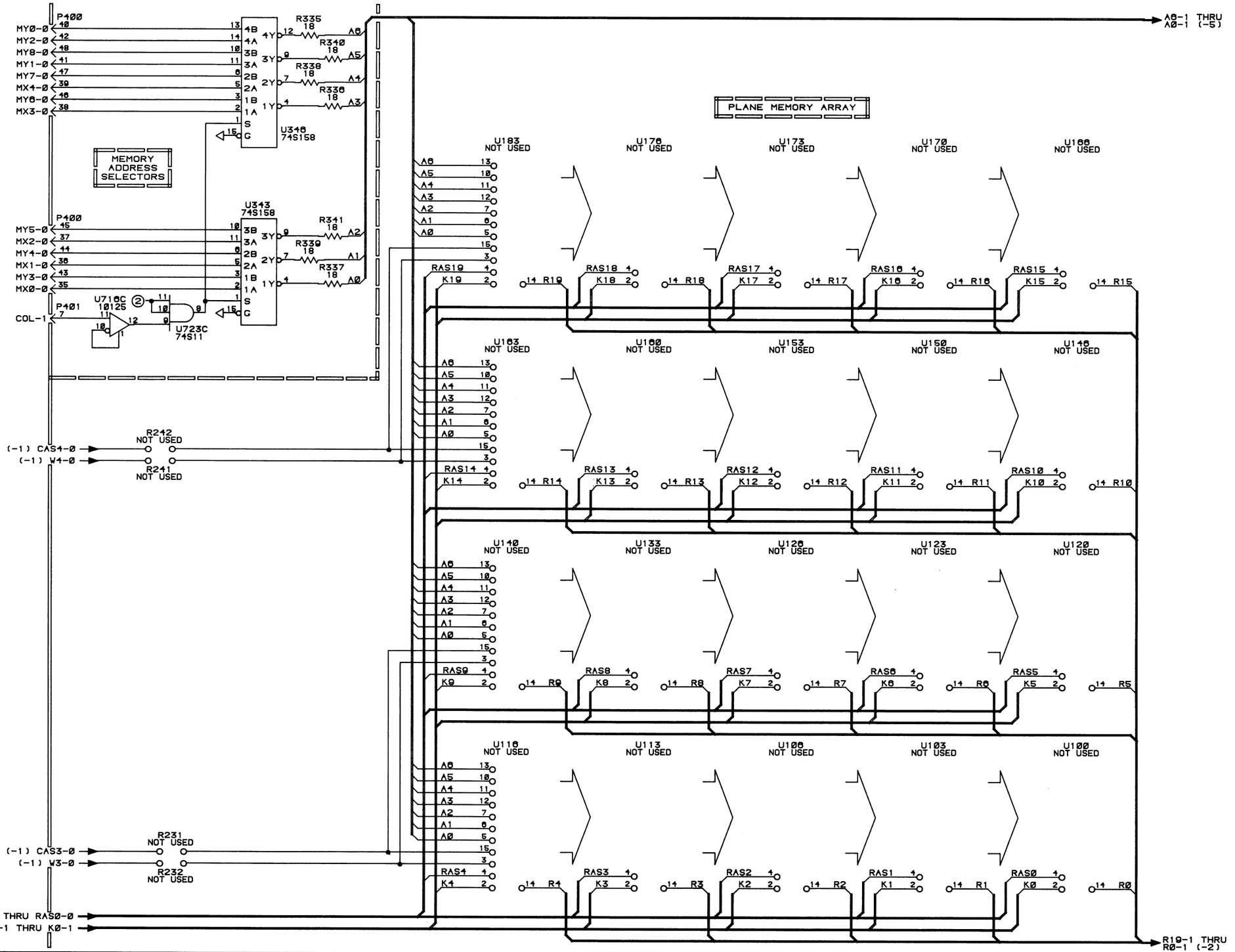


INSTRUMENT:	NOTES:	BOARD: 670-7568-00	ASSEMBLY-SHEET:
4113	□ INDICATES SHOWN MORE THAN ONCE AND WHERE (-) 12618-S29	SINGLE RASTER MEMORY BD.	A9-1 (1 OF 7)

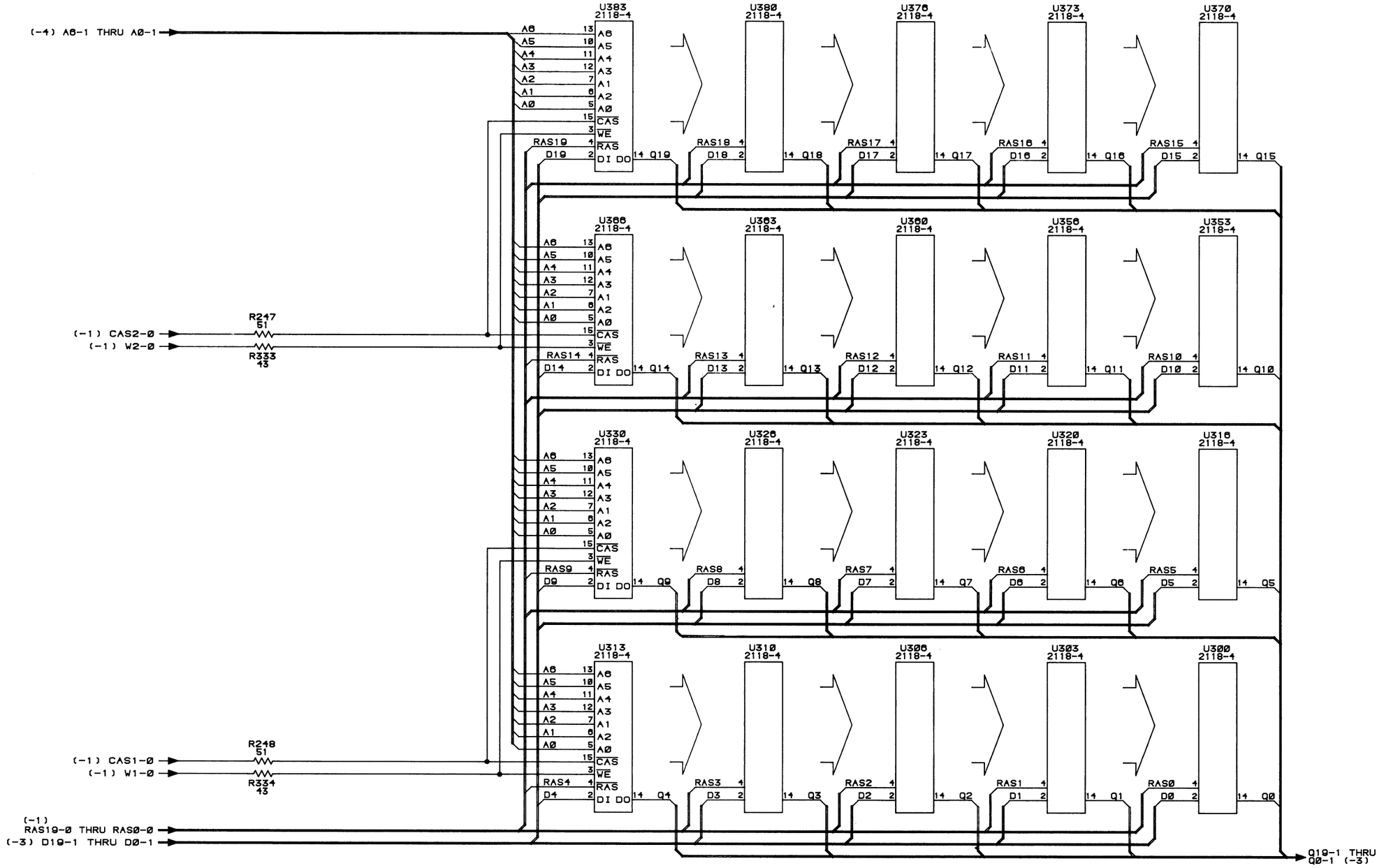


INSTRUMENT:	NOTES:		BOARD: 670-7568-00	ASSEMBLY-SHEET:
4113	□ INDICATES SHOWN MORE THAN ONCE AND WHERE (-)	12618-S30	SINGLE RASTER MEMORY BD.	A9-2 (2 OF 7)

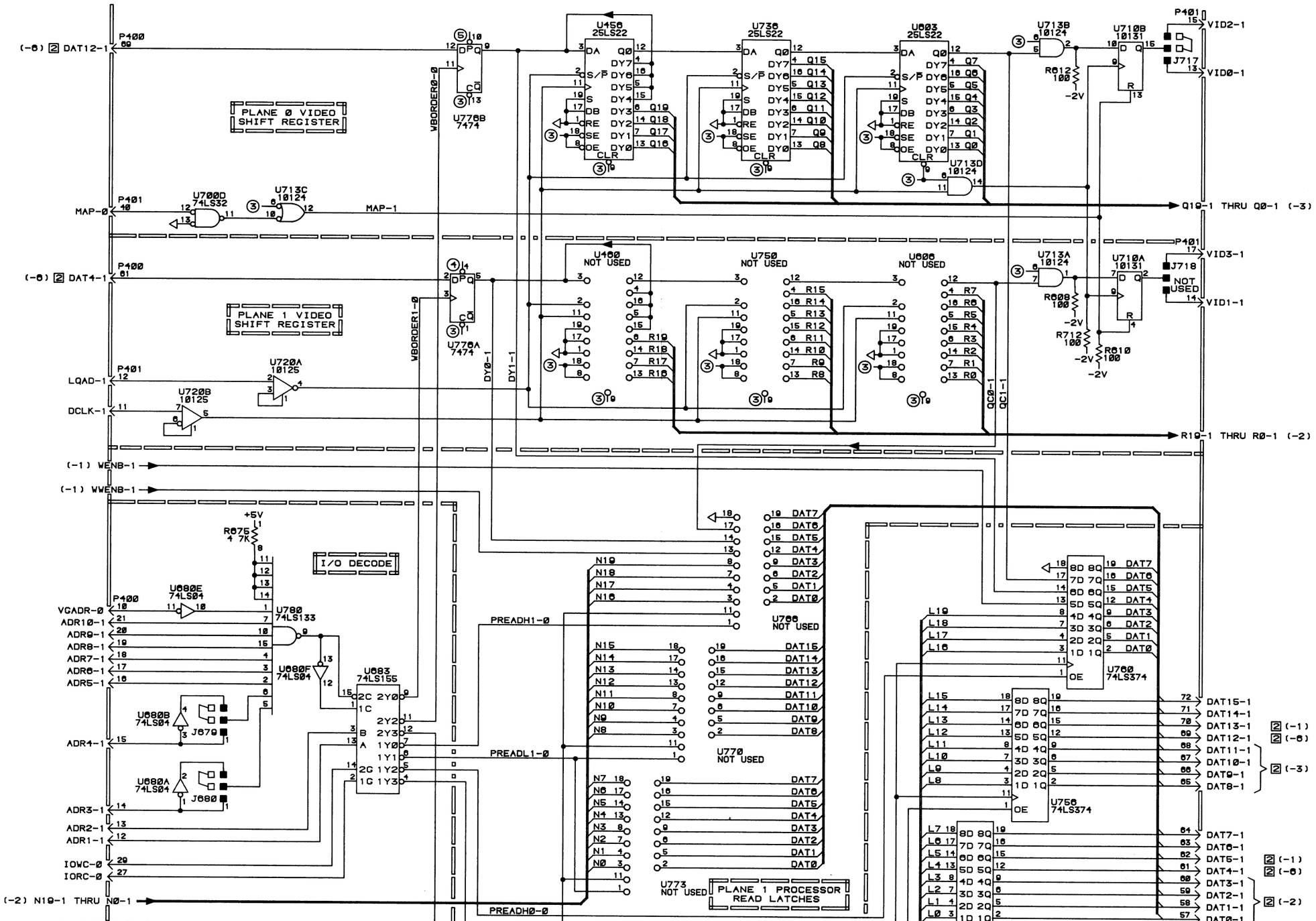

D19-1 THRU D0-1 (-5)
L19-1 THRU L0-1 (-6)
EQUAL-1
PLANE 0 ALUS
+5V
R807 1K
R814 1K
R811 1K
CR809
Q815
Q816
P400 74
U579 74LS181
U553 74LS181
U530 74LS181
U513 74LS181
U503 74LS181
P/O U476 74LS374
P/O U458 NOT USED
P/O U428 NOT USED
P/O U495 NOT USED
P/O U445 NOT USED
P/O U415 NOT USED
U483 74LS259
U550 74LS259
U520 74LS259
U540 74LS374
U510 74LS374
U703 74LS374
U453 74LS373
U506 74LS373
U600 74LS373
R472 4.7K
R020 1K
R036 1K
R021 1K
R035 1K
PLANE 0 VECTOR DATA INPUT
PLANE 0 BLOCK MOVE LATCH
J402
P401
J707
P400
X19-1
X18-1
X17-1
X16-1
X15-1
X14-1
X13-1
X12-1
X11-1
X10-1
X9-1
X8-1
X7-1
X6-1
X5-1
X4-1
X3-1
X2-1
X1-1
X0-1
-1) BMP2-0 THRU BMP0-0
-1) P2-0 THRU P0-0
PDAT2-0
PDAT0-0
-1) VENB-1
-2) INTERNAL-1
-2) INTERNAL-0
DAT11-1
DAT10-1
DAT0-1
DAT8-1
(-5) 2
-6) WALU0-0
-1) BLOCKMOVEDEST-1
(-5,0) Q19-1 THRU Q0-1
(-2) LATCH -0
(-2) EQ-1
BOARD: 670-7568-00
SINGLE RASTER MEMORY BD.
ASSEMBLY-SHEET:
A9-3
(3 OF 7)
INSTRUMENT:
4113
NOTES:
INDICATES SHOWN MORE THAN ONCE AND WHERE (-)
12618-531



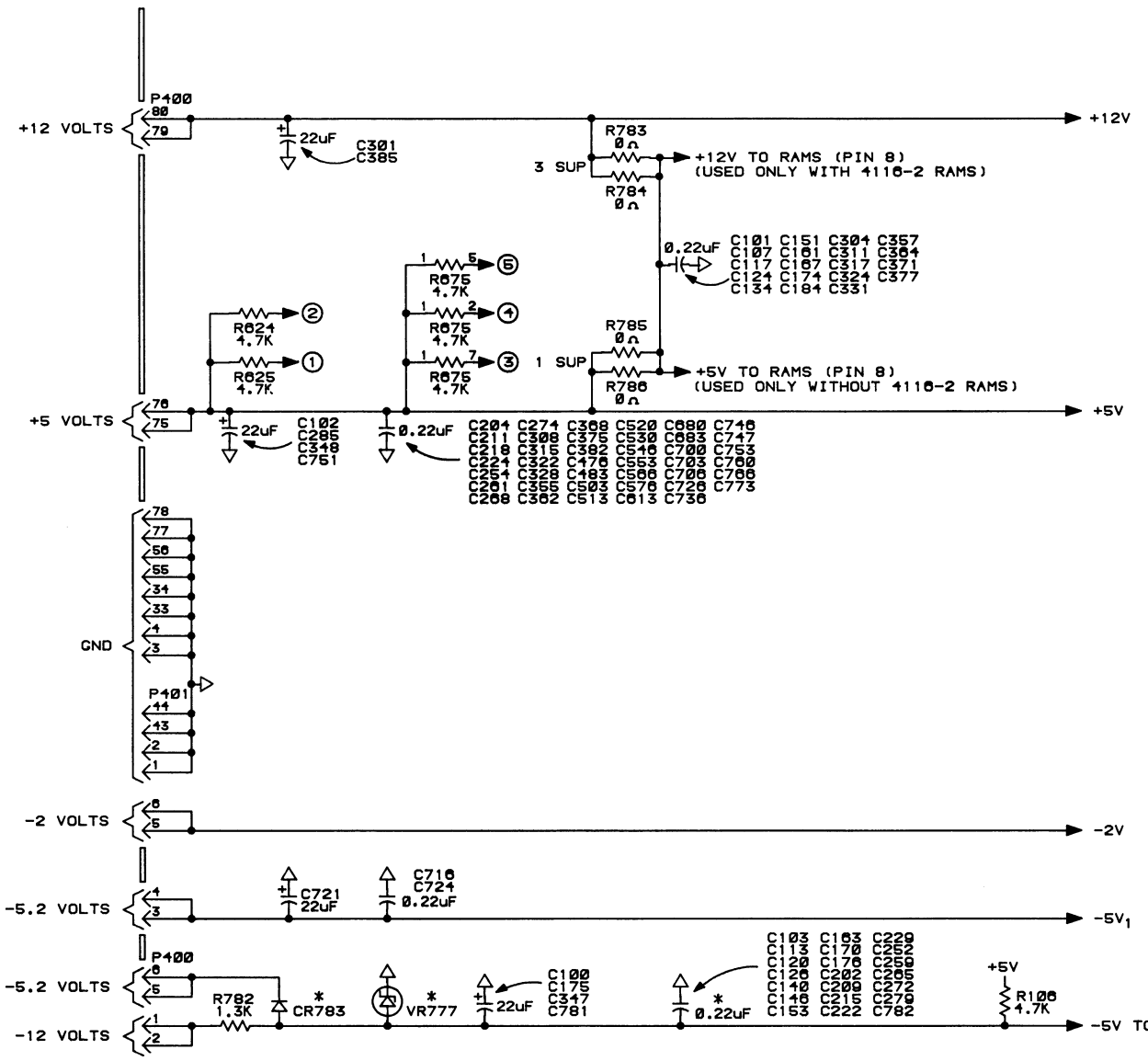
INSTRUMENT:	NOTES:	BOARD: 670-7568-00	ASSEMBLY-SHEET:
4113	12618-S32	SINGLE RASTER MEMORY BD. PLANE 1 MEMORY ARRAY	A9-4 (4 OF 7)



INSTRUMENT:	NOTES:	BOARD: 670-7568-00	ASSEMBLY-SHEET:
4113	12618-S33	SINGLE RASTER MEMORY BD. PLANE Ø MEMORY ARRAY	A9-5 (5 OF 7)



INSTRUMENT:	NOTES:		BOARD: 670-7568-00	ASSEMBLY-SHEET:
4113	☐ INDICATES SHOWN MORE THAN ONCE AND WHERE (-)	12618-S34	SINGLE RASTER MEMORY BD.	A9-6 (6 OF 7)



IC SUPPLIES					
DEVICE TYPE	PIN				
	+12V	+5V	GND	-5V	$-5V_1$
74LS139 74LS155 74S158 74S166 74S259	-	16	8	-	-
74S240 74S241 74S244 74S373 74S374	-	20	10	-	-
74LS181	-	24	12	-	-
10124 10125 10131	- - -	9 9 -	16 16 1,16	- - -	 8
2118-4 †4116-2	8	9	16	1	-
OTHER 14 PIN IC'S	-	14	7	-	-

† OPTIONAL CHIP TO 2118-4

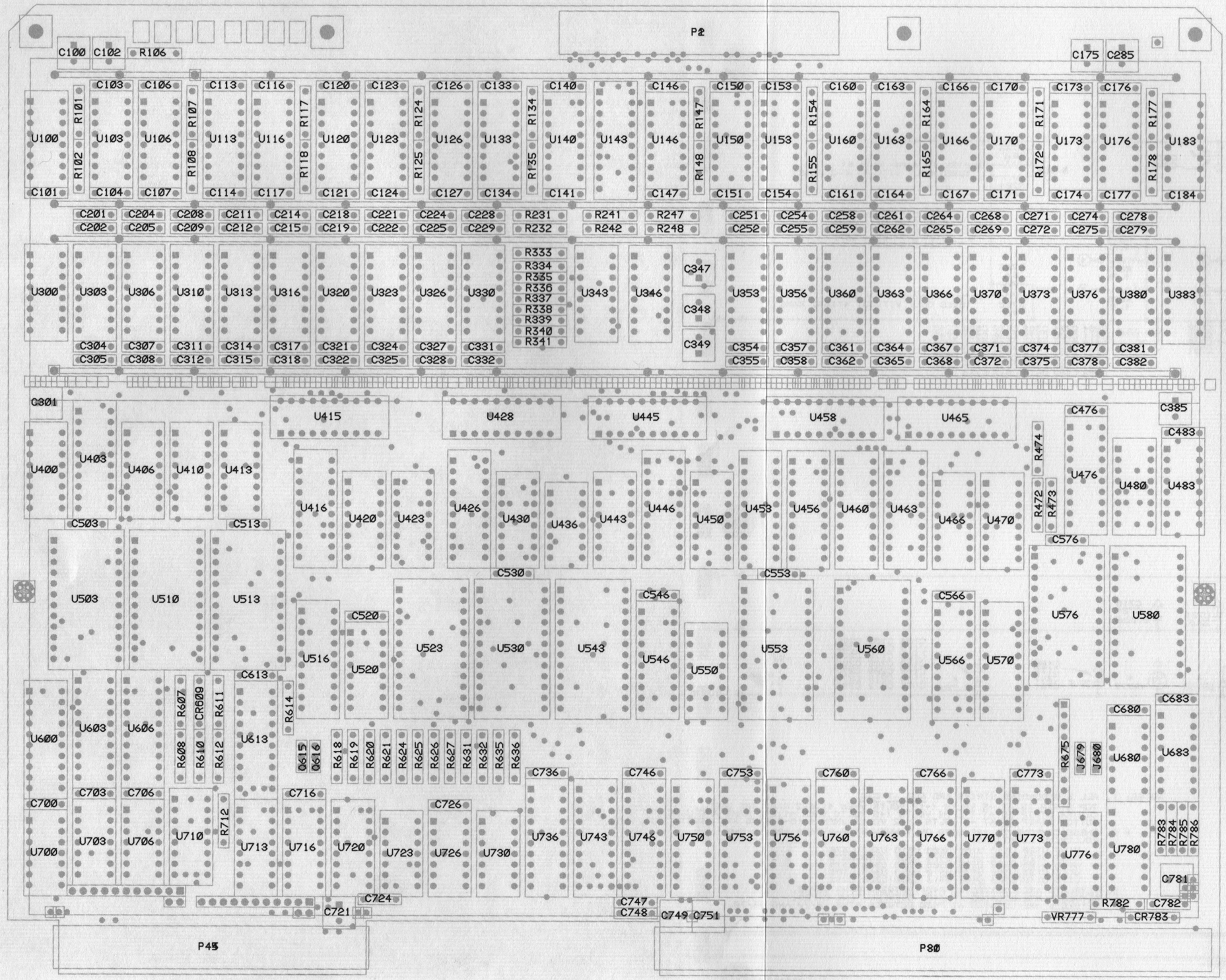
NOTES: 1. ALL 3 GROUNDING STRIPS ARE NOT AT GND.
TOP STRIP IS AT +5 VOLTS (+12 VOLTS WHEN 4116-2 RAMS ARE USED).
CENTER STRIP IS AT TTL HI VOLTS (+5 VOLTS WHEN 4116-2 RAMS ARE USED).
BOTTOM STRIP IS AT +5 VOLTS (+12 VOLTS WHEN 4116-2 RAMS ARE USED).

* 2. THESE COMPONENTS ARE USED ONLY WHEN 4116-2 RAMS ARE IN THE FOLLOWING LOCATIONS:

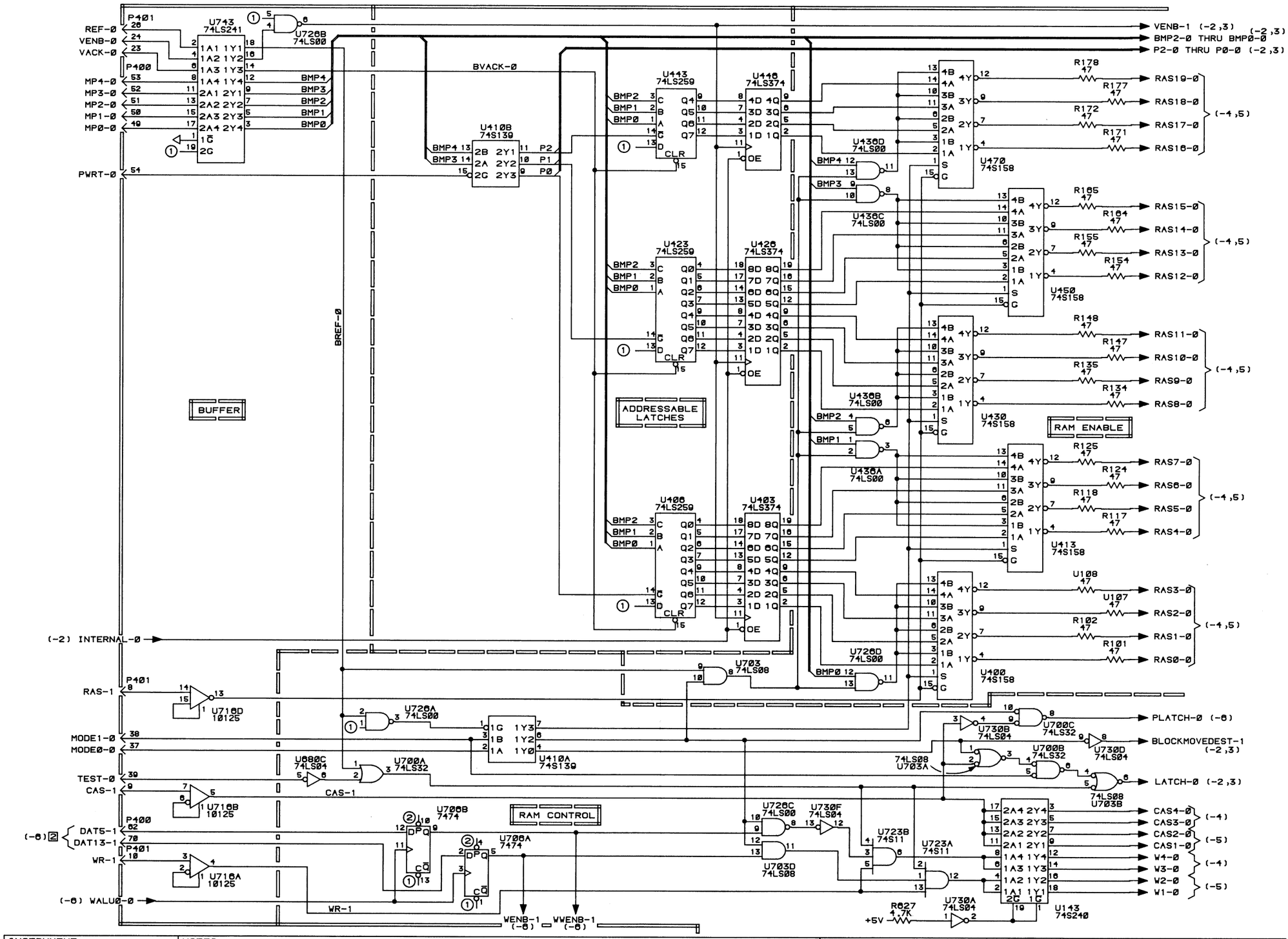
U100 U120 U140 U160 U300 U316 U353 U370
U103 U123 U150 U170 U303 U320 U356 U373
U106 U126 U153 U173 U306 U323 U360 U376
U113 U133 U100 U176 U310 U326 U363 U380
U116 U140 U163 U183 U313 U330 U366 U383

3. KEYSLOTS ARE LOCATED AT P401 BETWEEN PINS 18/20.
KEYSLOTS ARE LOCATED AT J402 BETWEEN PINS 24/26.
KEYSLOTS ARE LOCATED AT P400 BETWEEN PINS 18/20 AND 68/70.

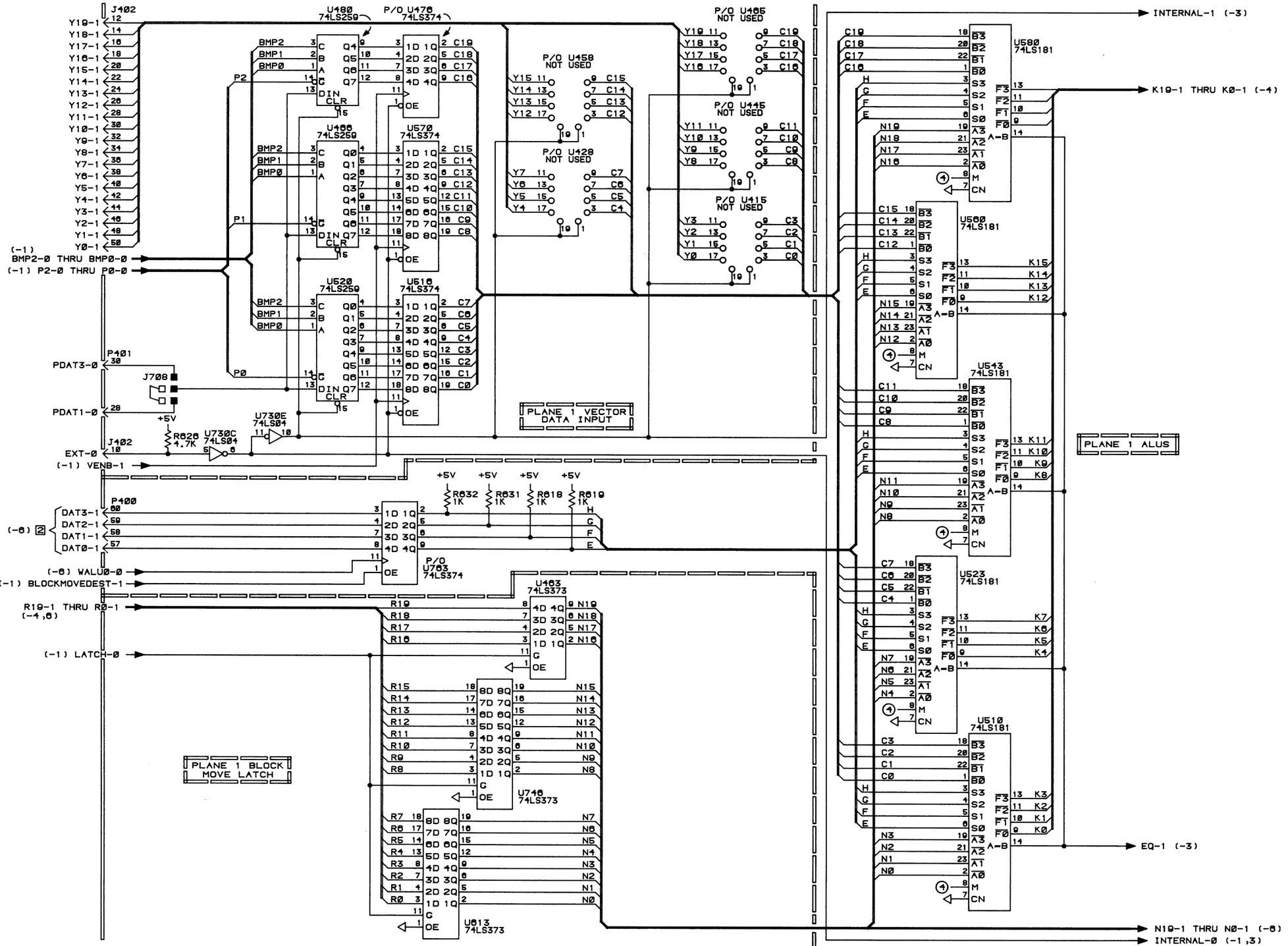
INSTRUMENT:	NOTES:	BOARD: 670-7568-00	ASSEMBLY-SHEET:
4113	12618-S35	SINGLE RASTER MEMORY BD. POWER	A9-7 (7 OF 7)



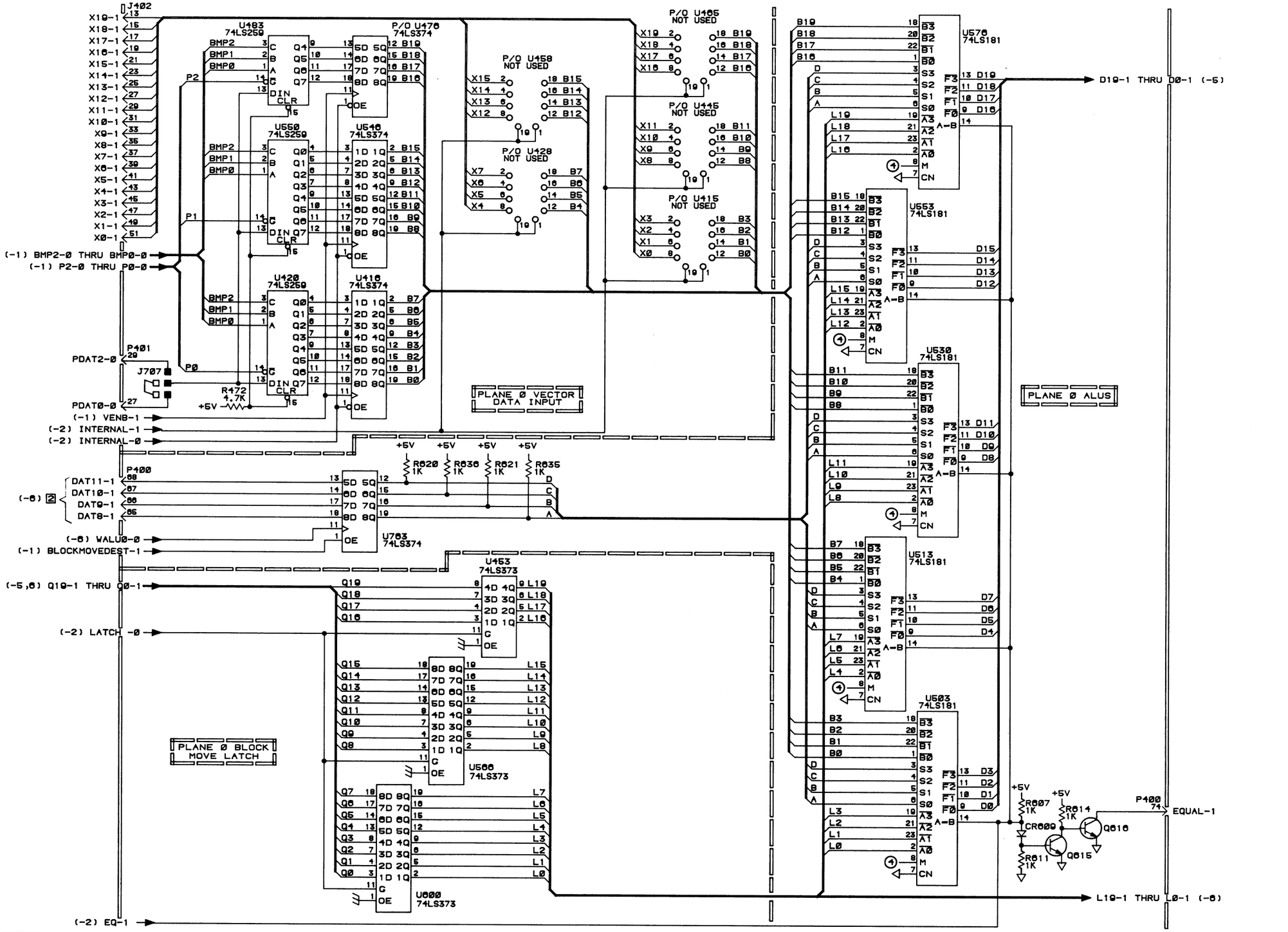
Dual Raster Memory Board (670-6476-01) Component Locations.



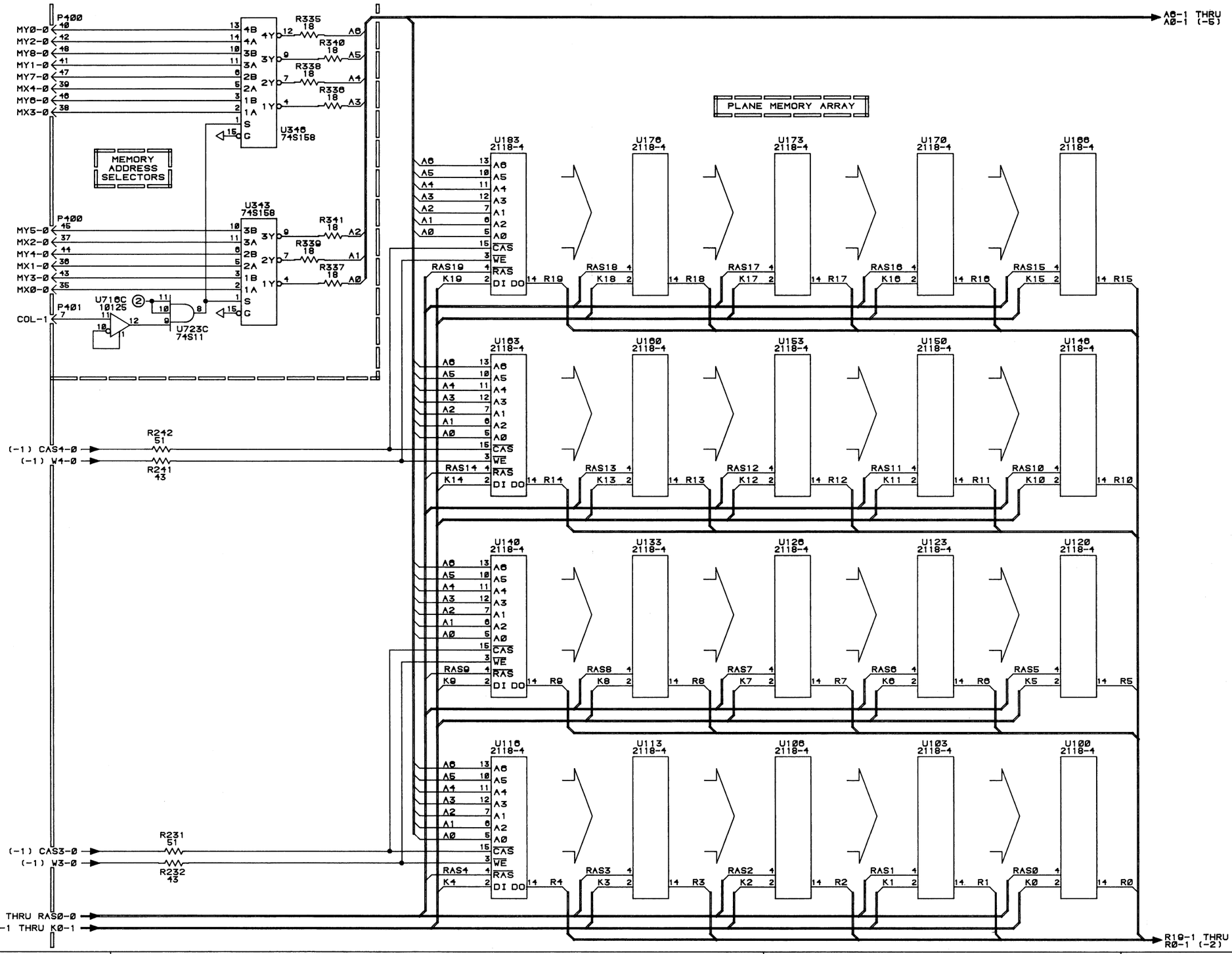
INSTRUMENT:	NOTES:	BOARD: 670-6476-01	ASSEMBLY-SHEET:
4113	☐ INDICATES SHOWN MORE THAN ONCE AND WHERE (-)	DUAL RASTER MEMORY BD.	A10-1 (1 OF 7)
	12618-S36		



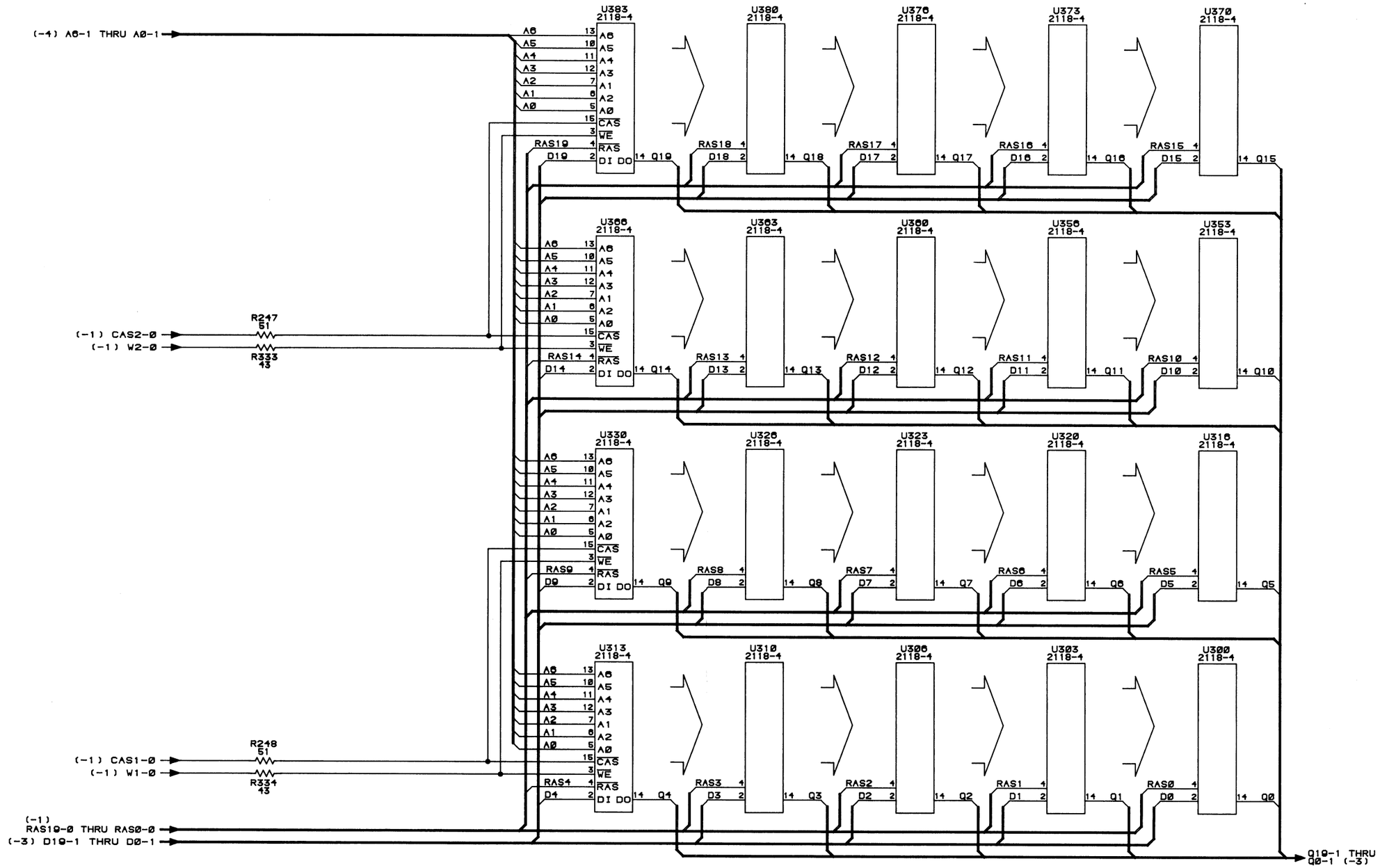
INSTRUMENT:	NOTES:		BOARD: 670-6476-01	ASSEMBLY-SHEET:
4113	☐ INDICATES SHOWN MORE THAN ONCE AND WHERE (-)	12618-S37	DUAL RASTER MEMORY BD.	A10-2 (2 OF 7)



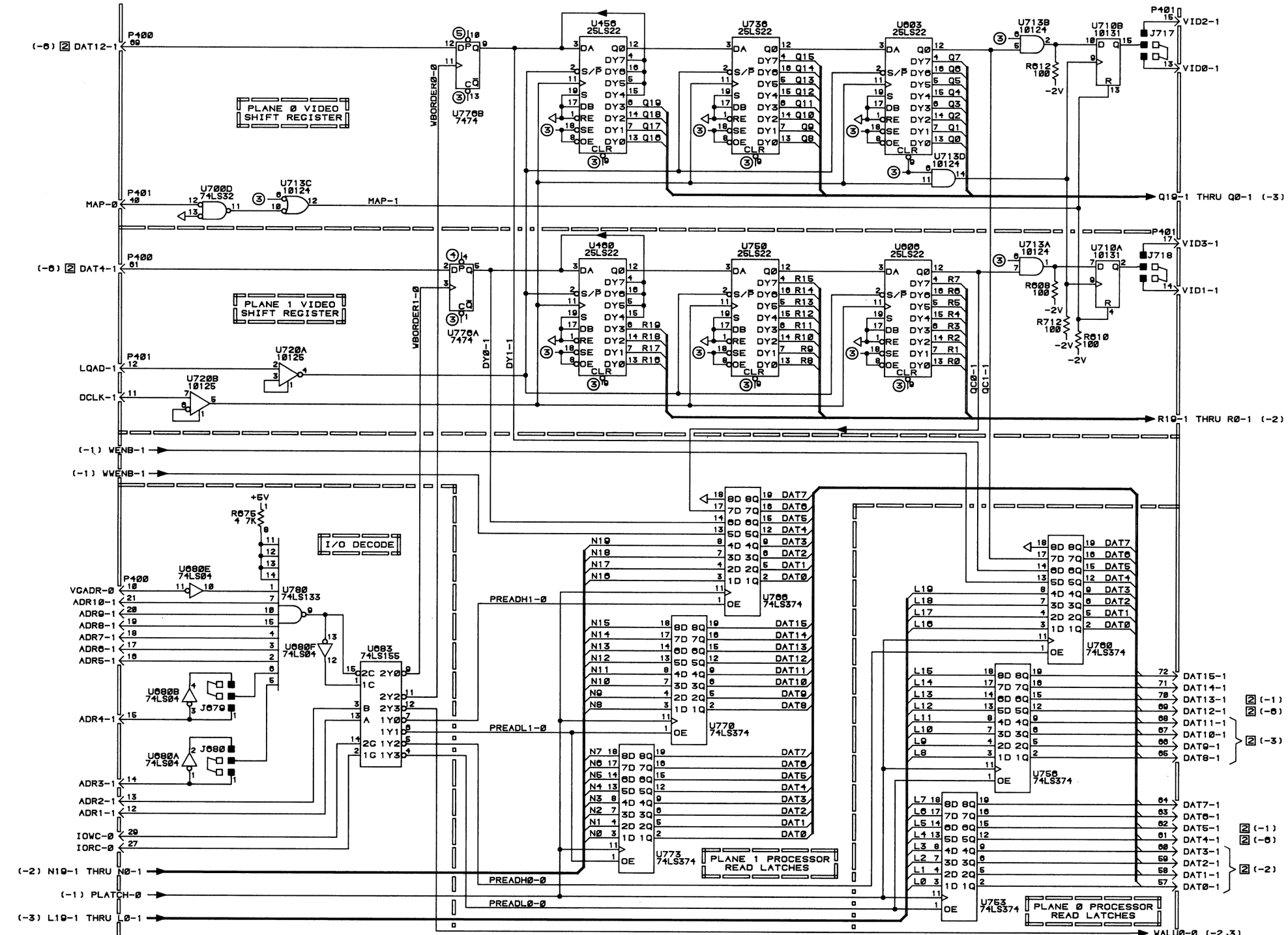
INSTRUMENT:	NOTES:		BOARD: 670-6476-01	ASSEMBLY-SHEET:
4113	☐ INDICATES SHOWN MORE THAN ONCE AND WHERE (-)	12618-S38	DUAL RASTER MEMORY BD.	A10-3 (3 OF 7)



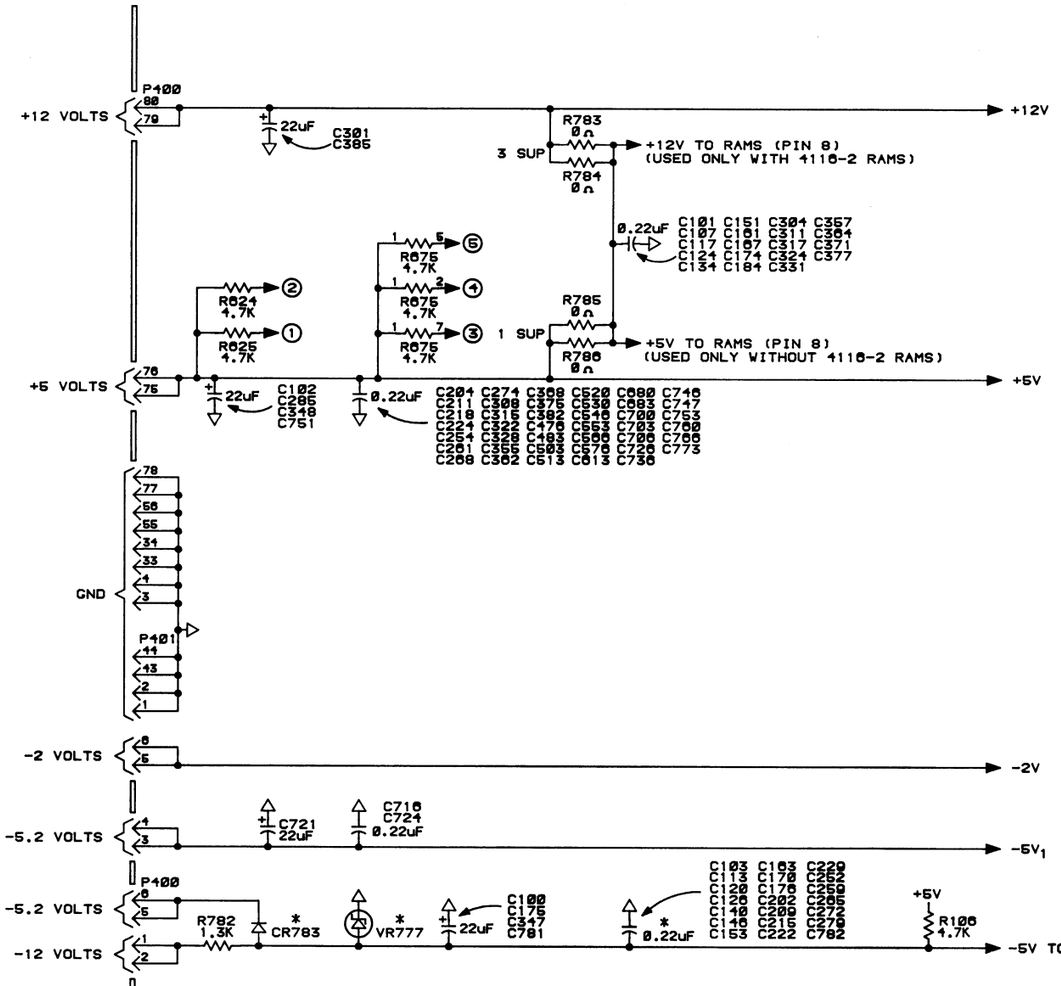
INSTRUMENT:	NOTES:	BOARD: 670-6476-01	ASSEMBLY-SHEET:
4113	12618-S39	DUAL RASTER MEMORY BD. PLANE 1 MEMORY ARRAY	A10-4 (4 OF 7)



INSTRUMENT:	NOTES:	BOARD: 670-6476-01	ASSEMBLY-SHEET:
4113	12618-S40	DUAL RASTER MEMORY BD. PLANE Ø MEMORY ARRAY	A10-5 (5 OF 7)



INSTRUMENT:	NOTES:		BOARD: 670-6476-01	ASSEMBLY-SHEET:
4113	□ INDICATES SHOWN MORE THAN ONCE AND WHERE (-)	12618-541	DUAL RASTER MEMORY BD.	A10-6 (6 OF 7)



NOTES: 1. ALL 3 GROUNDING STRIPS ARE NOT AT GND.
TOP STRIP IS AT +5 VOLTS (+12 VOLTS WHEN 4116-2 RAMS ARE USED).
CENTER STRIP IS AT TTL HI VOLTS (+5 VOLTS WHEN 4116-2 RAMS ARE USED).
BOTTOM STRIP IS AT +5 VOLTS (+12 VOLTS WHEN 4116-2 RAMS ARE USED).

* 2. THESE COMPONENTS ARE USED ONLY WHEN 4116-2 RAMS ARE IN THE FOLLOWING LOCATIONS:

U100 U120 U140 U160 U300 U316 U353 U370
U103 U123 U150 U170 U303 U320 U356 U373
U106 U126 U153 U173 U306 U323 U360 U376
U113 U133 U160 U176 U310 U326 U363 U380
U116 U140 U163 U183 U313 U330 U366 U383

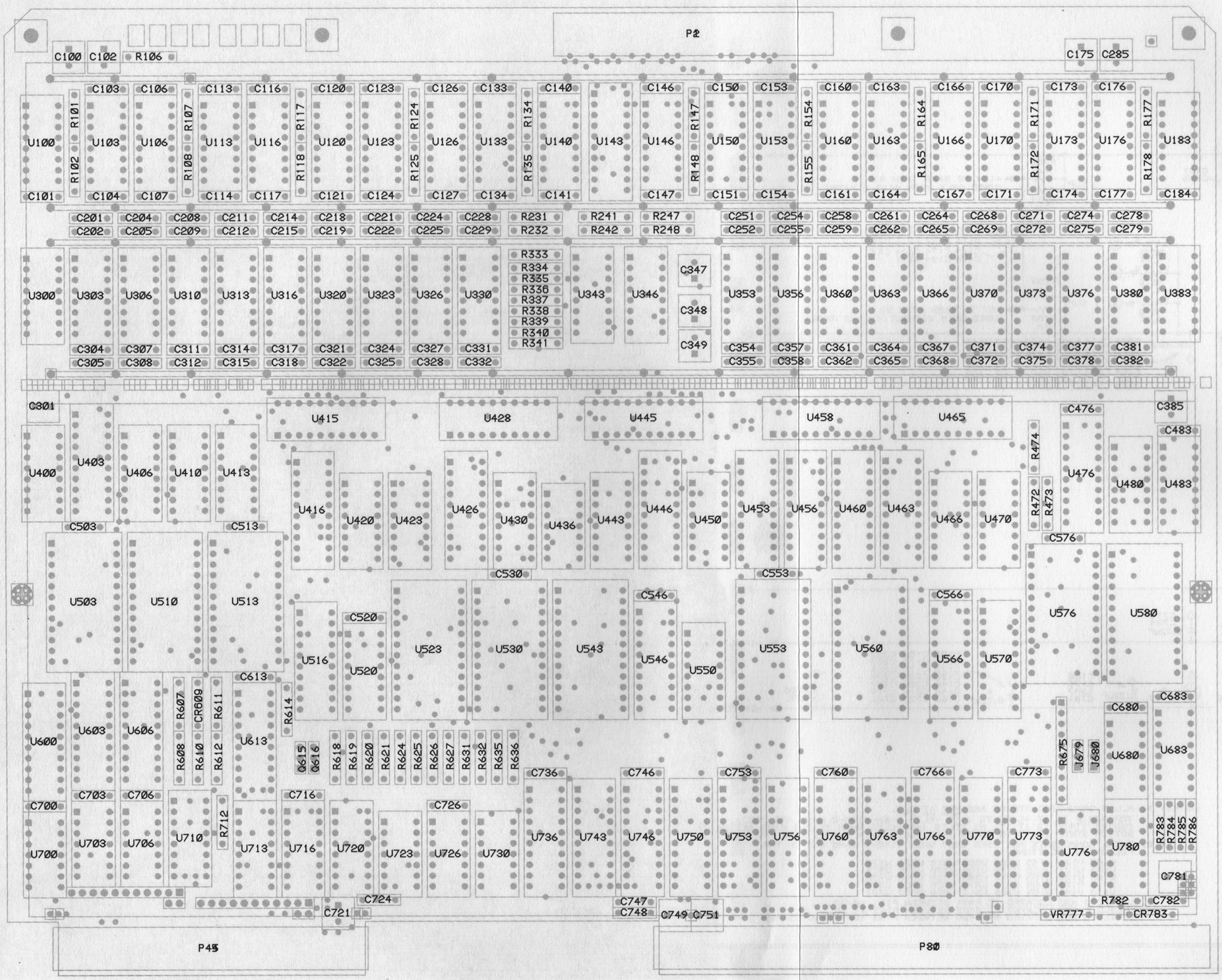
3. KEYSLOTS ARE LOCATED AT P401 BETWEEN PINS 18/20.
KEYSLOTS ARE LOCATED AT J402 BETWEEN PINS 24/26.
KEYSLOTS ARE LOCATED AT P400 BETWEEN PINS 18/20 AND 68/70.

IC SUPPLIES

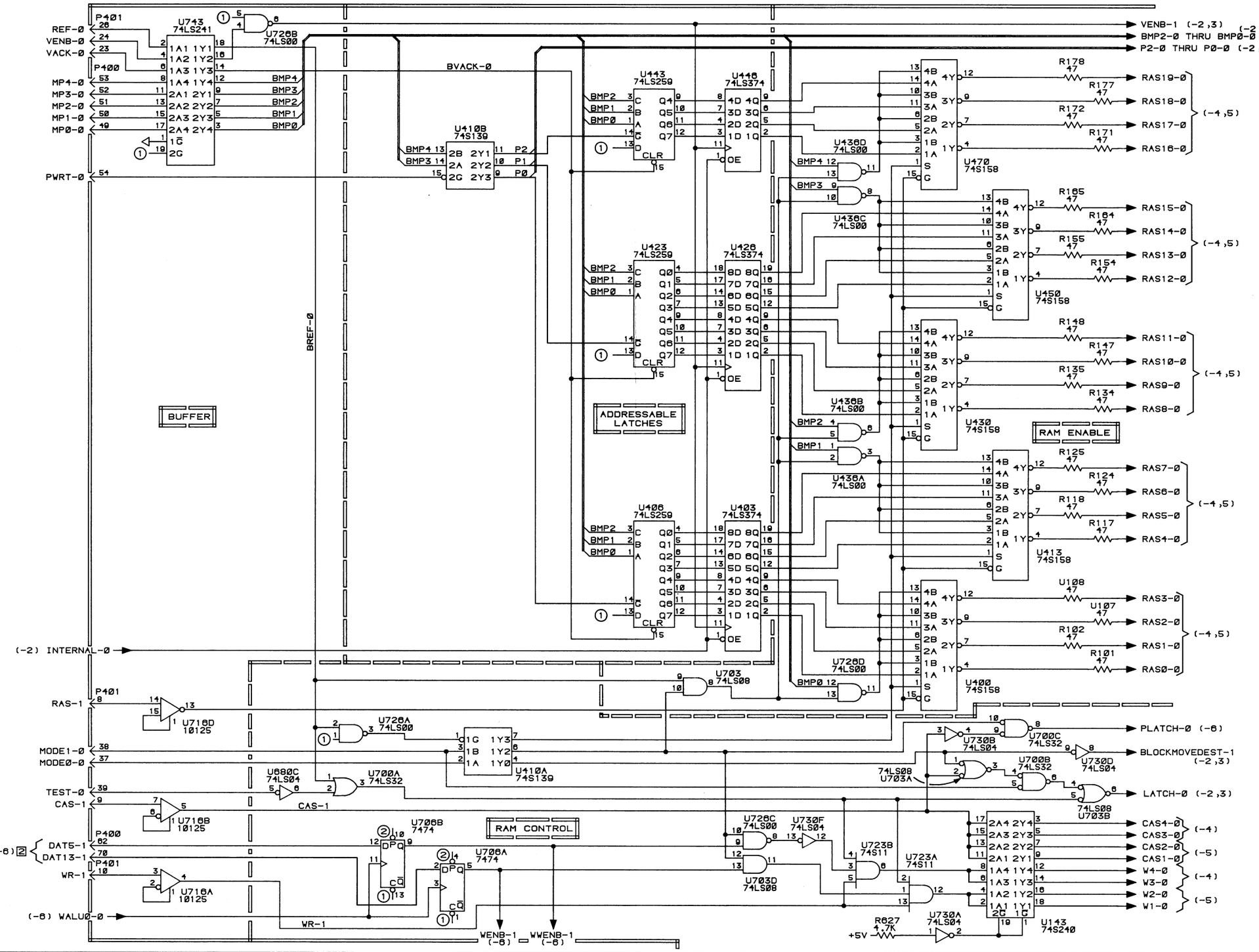
DEVICE TYPE	PIN				
	+12V	+5V	GND	-5V	$-5V_1$
74LS139 74LS155 74S158 74S188 74S259	-	16	8	-	-
74S240 74S241 74S244 74S373 74S374	-	20	10	-	-
74LS181	-	24	12	-	-
10124 10125 10131	- - -	9 9 -	16 16 1,16	- - -	 8
2118-4 †4116-2	8	9	16	1	-
OTHER 14 PIN IC'S	-	14	7	-	-

† OPTIONAL CHIP TO 2118-4

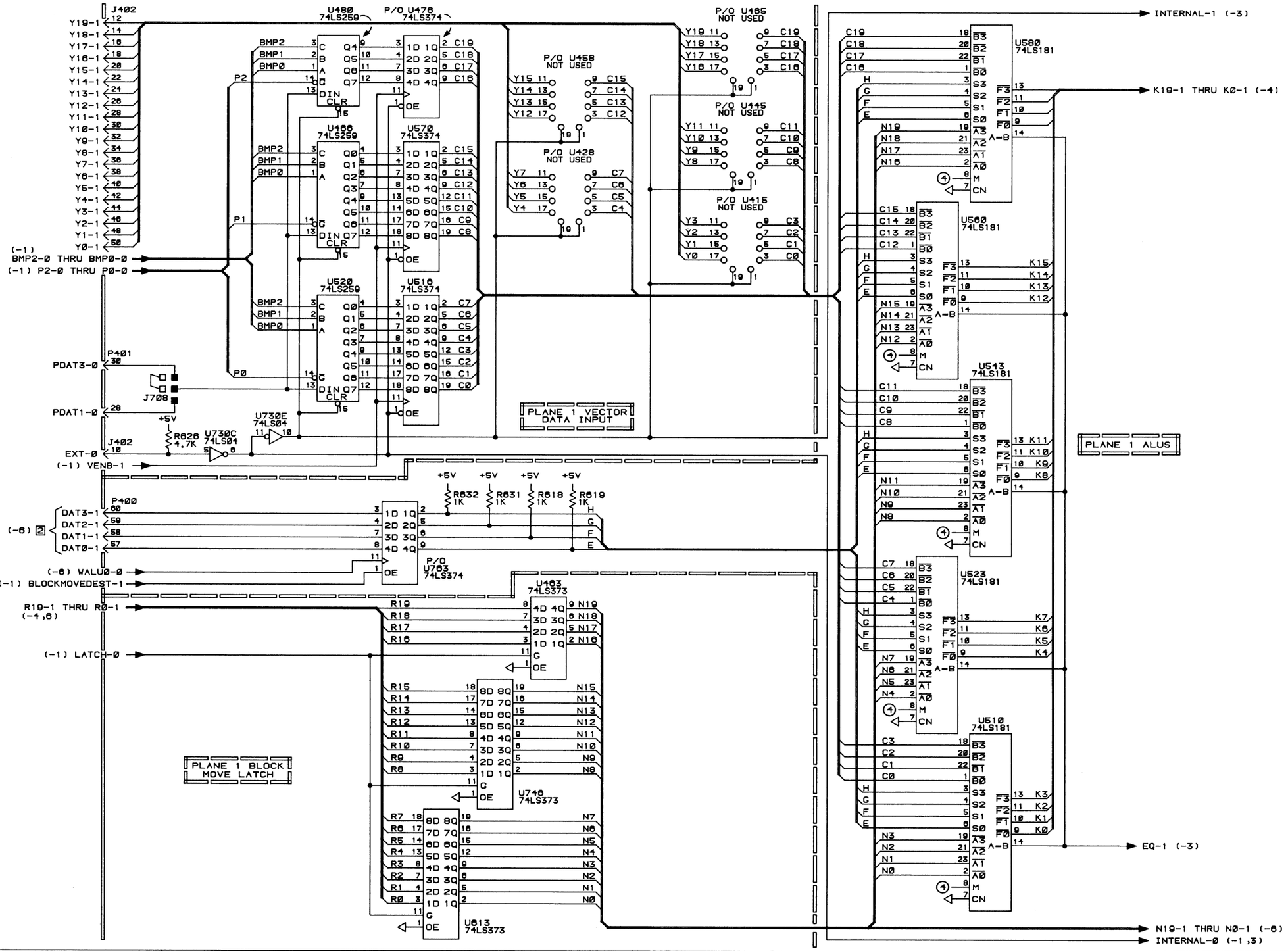
INSTRUMENT:	NOTES:	BOARD: 670-6476-01	ASSEMBLY-SHEET:
4113	12618-S42	DUAL RASTER MEMORY BD POWER	A10-7 (7 OF 7)



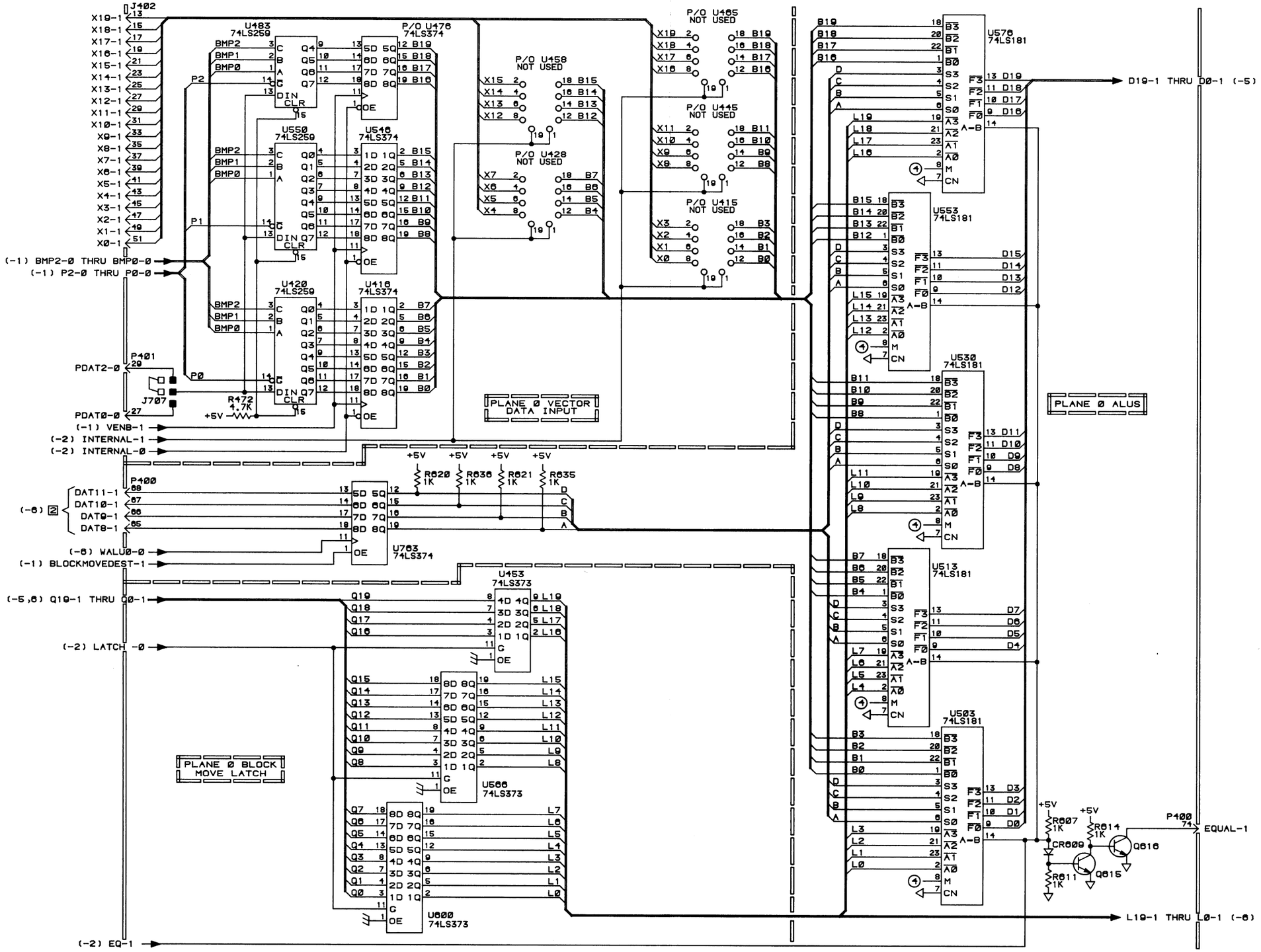
Dual Raster Memory Board (OPTION 21) (670-6476-01) Component Locations.



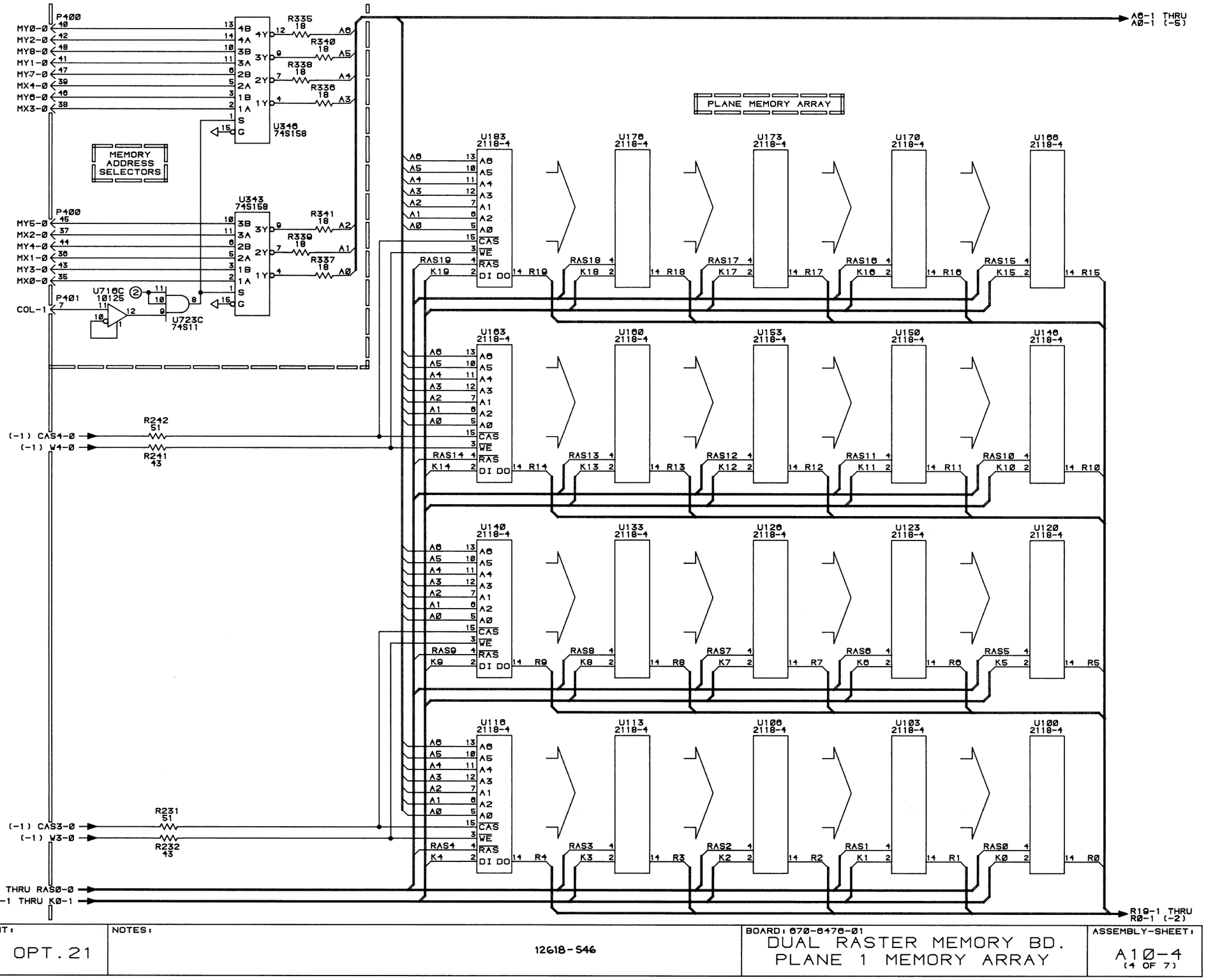
INSTRUMENT:	NOTES:		BOARD: 670-6476-01	ASSEMBLY-SHEET:
4113 OPT.21	□ INDICATES SHOWN MORE THAN ONCE AND WHERE (-)	12618-S43	DUAL RASTER MEMORY BD.	A10-1 (1 OF 7)



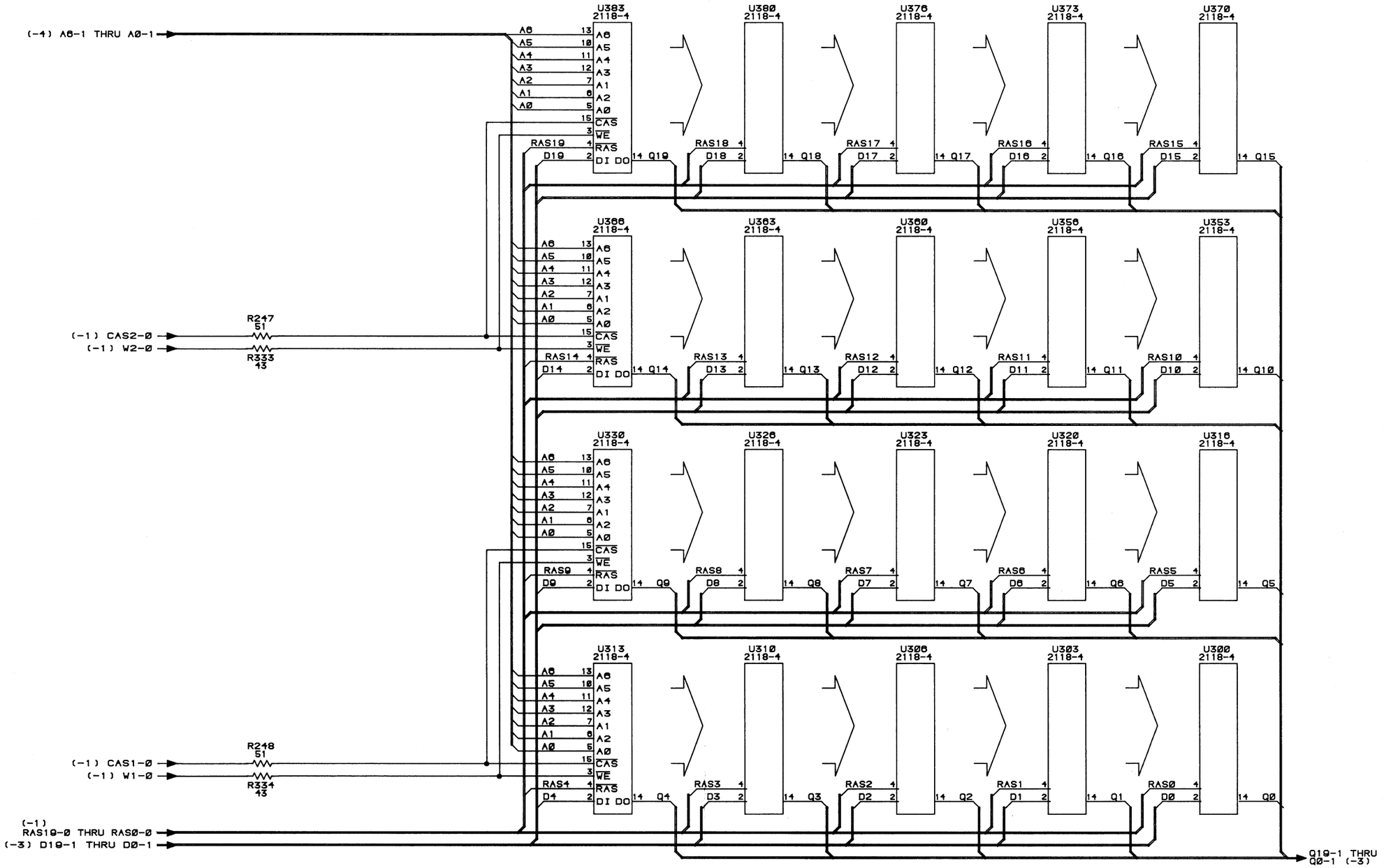
INSTRUMENT:	NOTES:		BOARD: 670-6476-01	ASSEMBLY-SHEET:
4113 OPT.21	☐ INDICATES SHOWN MORE THAN ONCE AND WHERE (-)	12618-544	DUAL RASTER MEMORY BD.	A10-2 (2 OF 7)



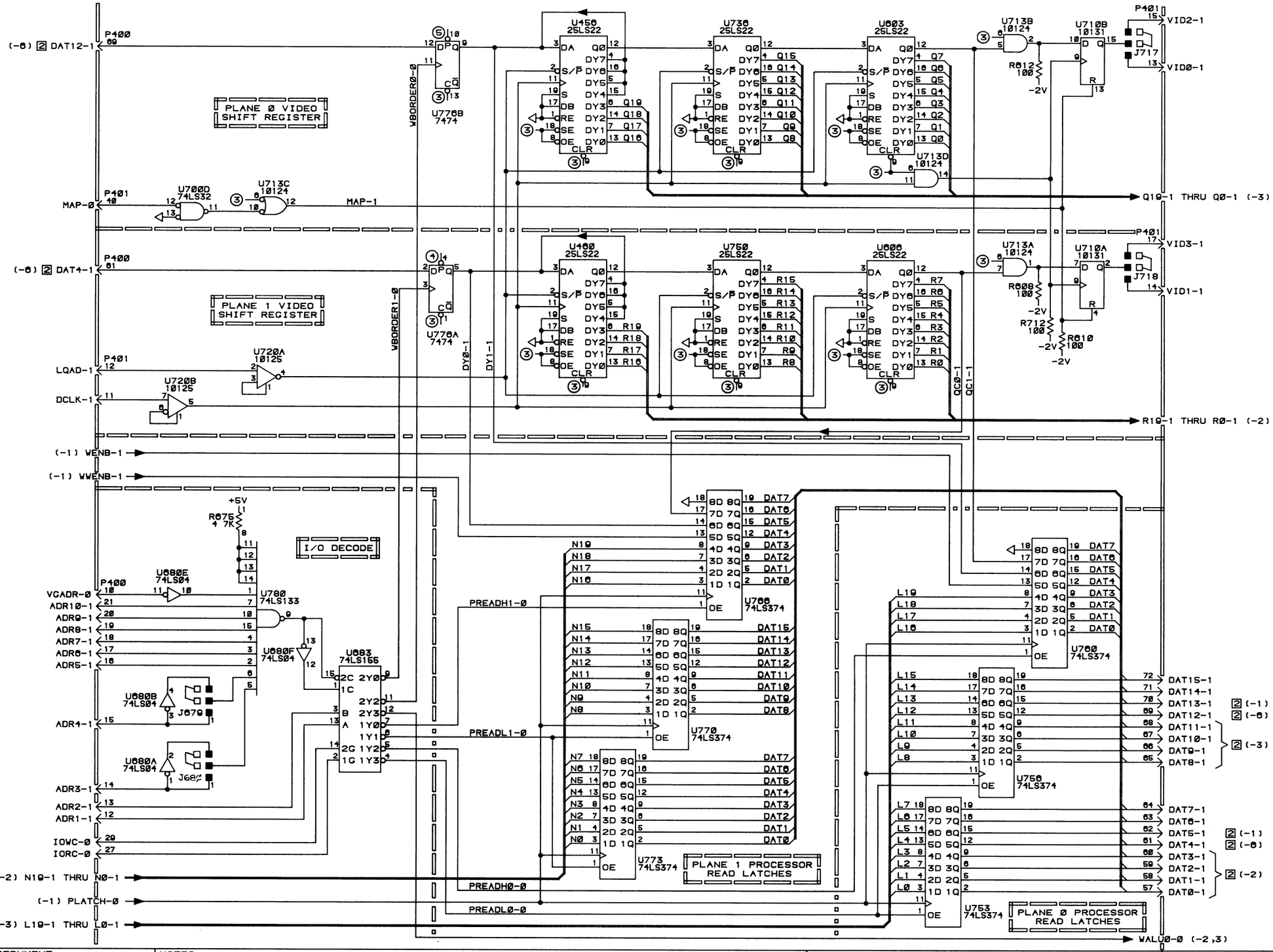
INSTRUMENT:	NOTES:		BOARD: 670-6476-01	ASSEMBLY-SHEET:
4113 OPT.21	☐ INDICATES SHOWN MORE THAN ONCE AND WHERE (-)	12618-S45	DUAL RASTER MEMORY BD.	A10-3 (3 OF 7)



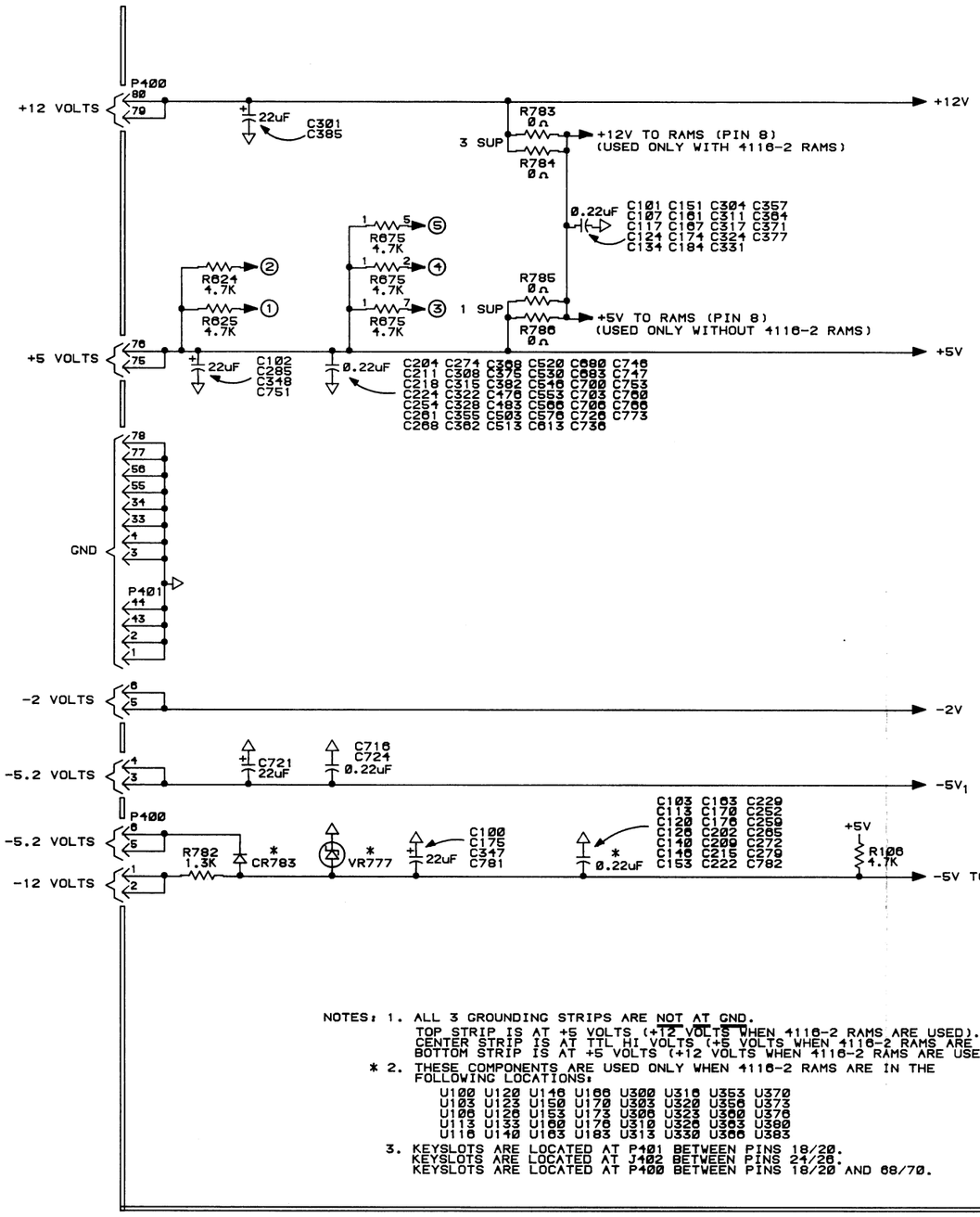
INSTRUMENT:	NOTES:	BOARD: 670-6476-01	ASSEMBLY-SHEET:
4113 OPT.21	12618-S46	DUAL RASTER MEMORY BD. PLANE 1 MEMORY ARRAY	A10-4 (4 OF 7)



INSTRUMENT:	NOTES:	BOARD: 670-6476-01	ASSEMBLY-SHEET:
4113 OPT.21	12618-S47	DUAL RASTER MEMORY BD. PLANE Ø MEMORY ARRAY	A1Ø-5 (5 OF 7)



INSTRUMENT:	NOTES:		BOARD: 670-6476-01	ASSEMBLY-SHEET:
4113 OPT. 21	☐ INDICATES SHOWN MORE THAN ONCE AND WHERE (-)	12618-S48	DUAL RASTER MEMORY BD.	A10-6 (6 OF 7)



IC SUPPLIES					
DEVICE TYPE	PIN				
	+12V	+5V	GND	-5V	$-5V_1$
74LS139 74LS155 74S158 74S188 74S259	-	16	8	-	-
74S240 74S241 74S244 74S373 74S374	-	20	10	-	-
74LS181	-	24	12	-	-
10124	-	9	16	-	8
10125	-	9	16	-	
10131	-	-	1,16	-	
2118-4 †4116-2	8	9	16	1	-
OTHER 14 PIN IC'S	-	14	7	-	-

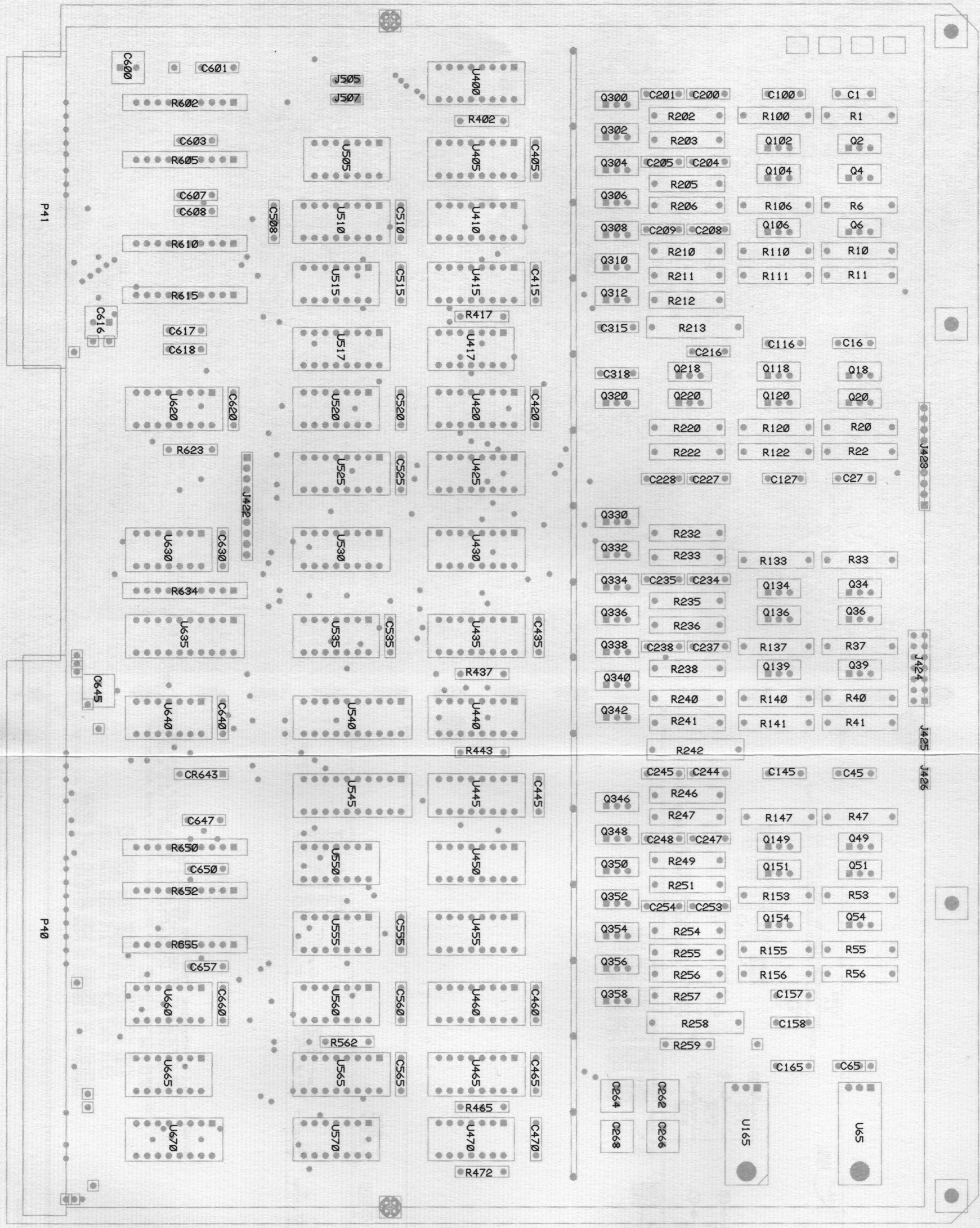
† OPTIONAL CHIP TO 2118-4

NOTES: 1. ALL 3 GROUNDING STRIPS ARE NOT AT GND.
TOP STRIP IS AT +5 VOLTS (+12 VOLTS WHEN 4116-2 RAMS ARE USED).
CENTER STRIP IS AT TTL HI VOLTS (+5 VOLTS WHEN 4116-2 RAMS ARE USED).
BOTTOM STRIP IS AT +5 VOLTS (+12 VOLTS WHEN 4116-2 RAMS ARE USED).

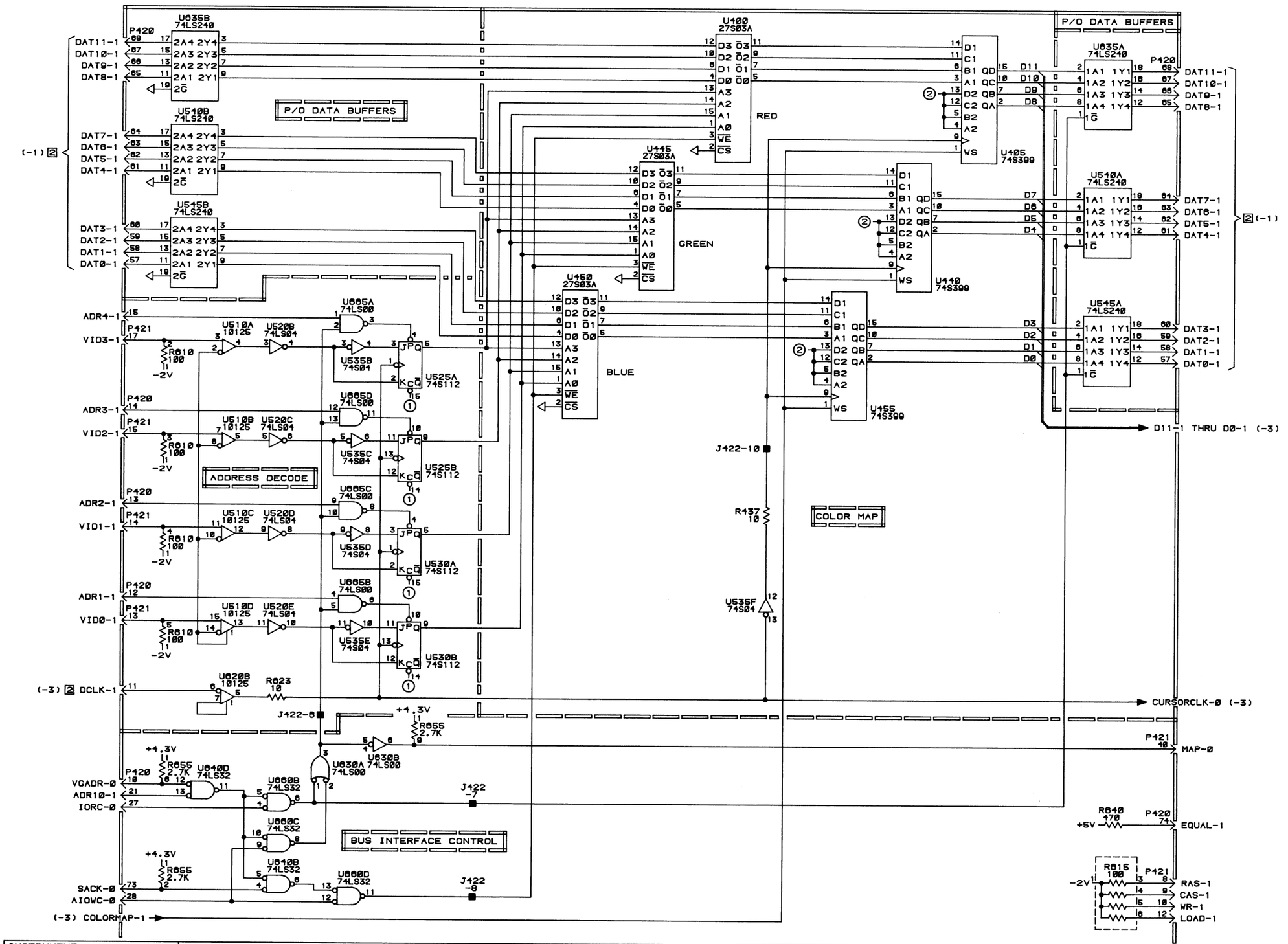
* 2. THESE COMPONENTS ARE USED ONLY WHEN 4116-2 RAMS ARE IN THE FOLLOWING LOCATIONS:
U100 U120 U146 U186 U300 U318 U353 U370
U103 U123 U150 U170 U303 U320 U358 U373
U106 U126 U153 U173 U306 U323 U360 U376
U113 U133 U160 U176 U310 U326 U363 U380
U116 U140 U163 U183 U313 U330 U366 U383

3. KEYSLOTS ARE LOCATED AT P401 BETWEEN PINS 18/20.
KEYSLOTS ARE LOCATED AT J402 BETWEEN PINS 24/26.
KEYSLOTS ARE LOCATED AT P400 BETWEEN PINS 18/20 AND 68/70.

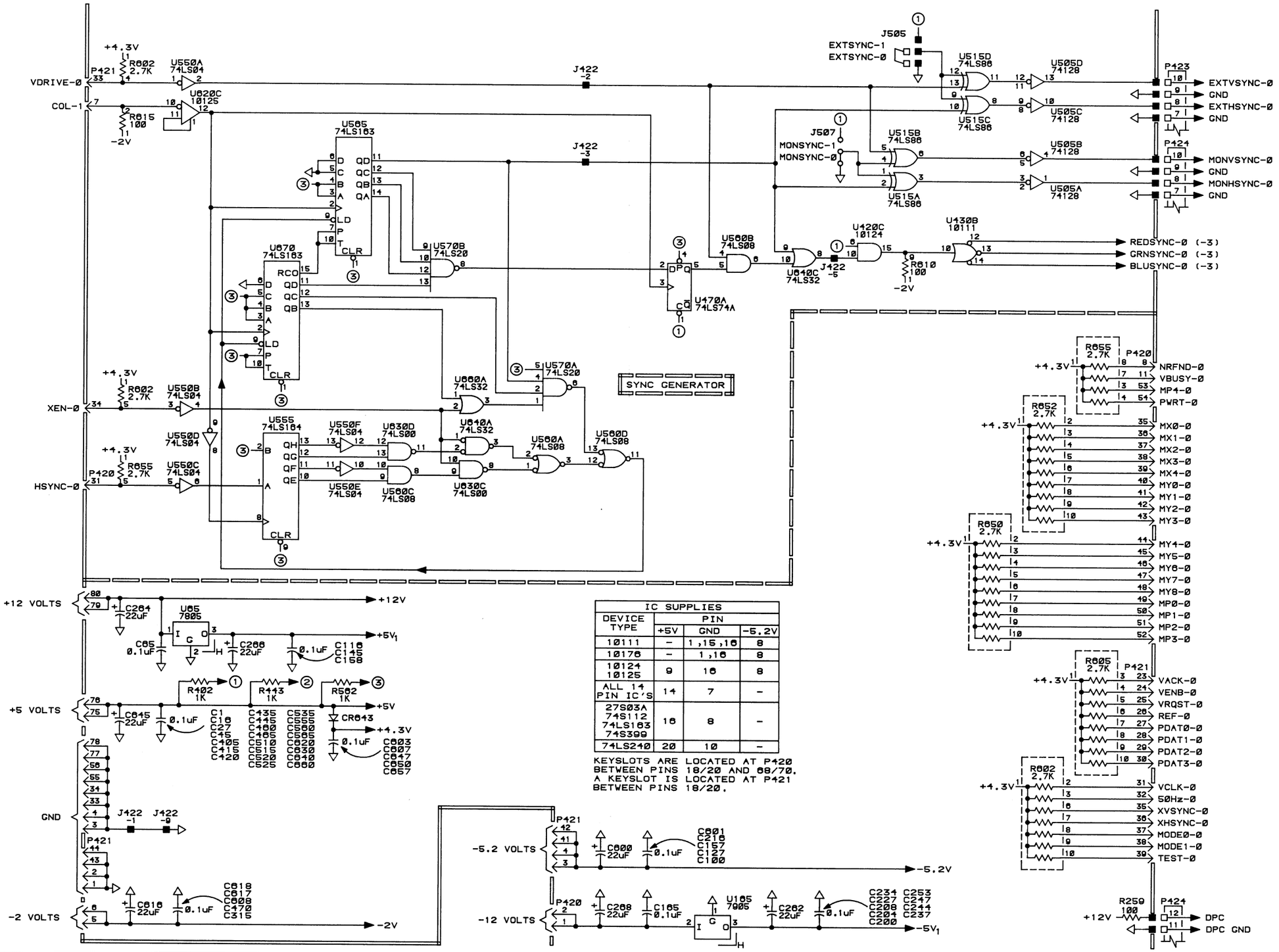
INSTRUMENT:	NOTES:	BOARD: 670-6476-01	ASSEMBLY-SHEET:
4113 OPT.21	12618-S49	DUAL RASTER MEMORY BD POWER	A10-7 (7 OF 7)



Color Map Board (670-7567-00) Component Locations.



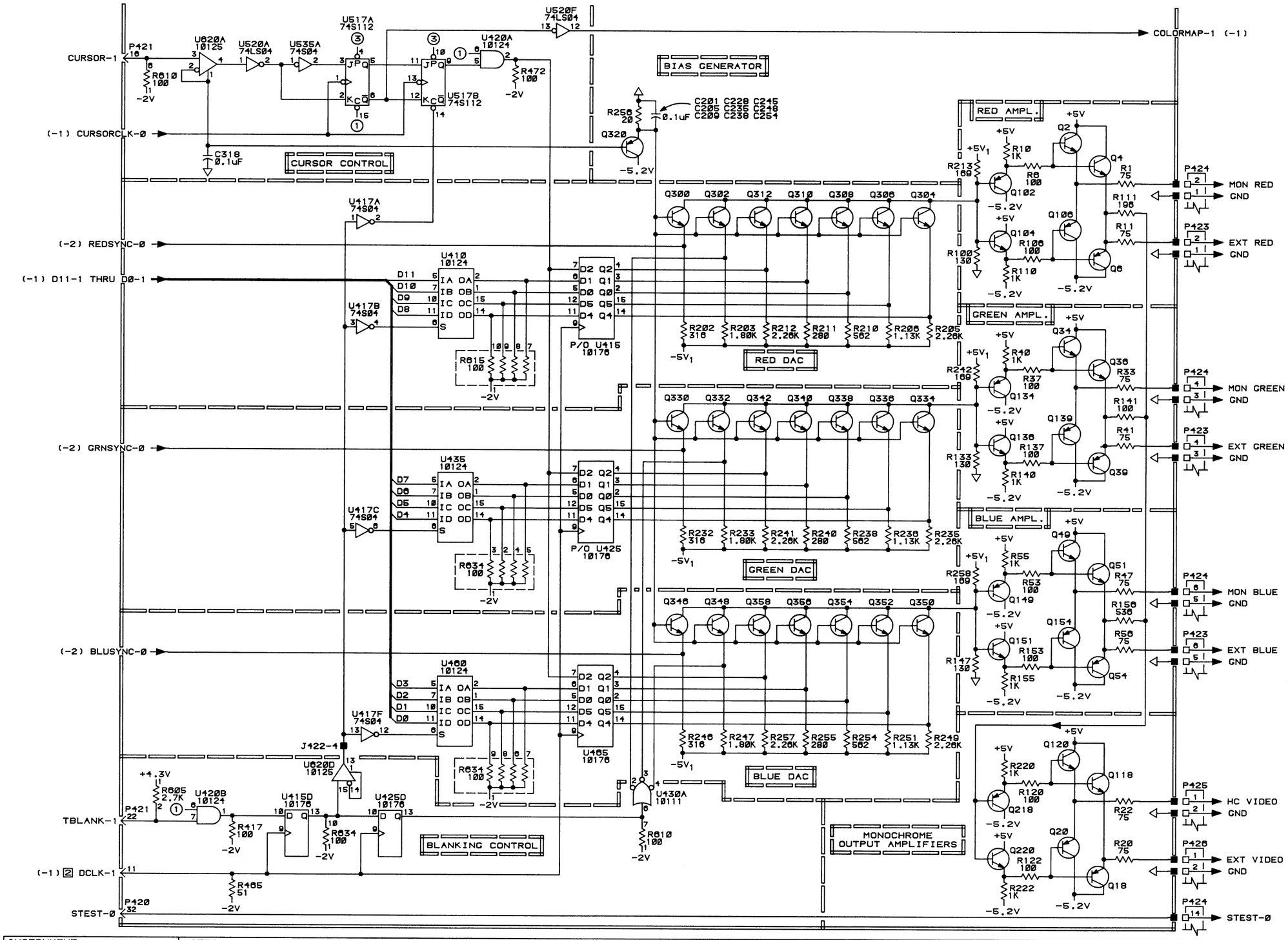
INSTRUMENT:	NOTES:	BOARD: 670-7567-00	ASSEMBLY-SHEET:
4113	☐ INDICATES SHOWN MORE THAN ONCE AND WHERE (-)	COLOR MAP BOARD	A11-1 (1 OF 3)
	12618-S50		



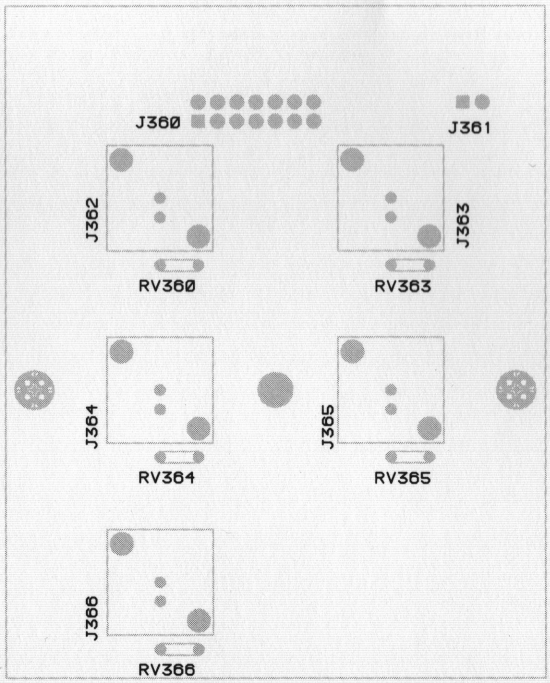
IC SUPPLIES			
DEVICE TYPE	PIN		
	+5V	GND	-5.2V
10111	–	1,15,16	8
10176	–	1,16	8
10124 10125	9	16	8
ALL 14 PIN IC'S	14	7	–
27S03A 74S112 74LS163 74S399	16	8	–
74LS240	20	10	–

KEYSLOTS ARE LOCATED AT P420 BETWEEN PINS 18/20 AND 68/70.
A KEYSLOT IS LOCATED AT P421 BETWEEN PINS 18/20.

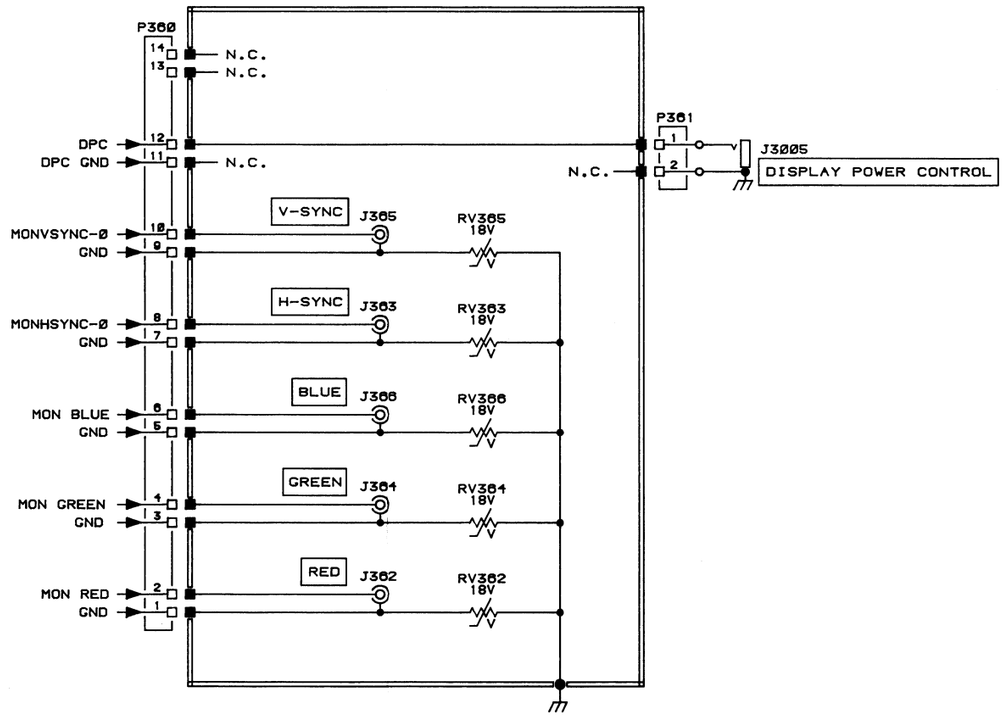
INSTRUMENT:	NOTES:	BOARD: 670-7567-00	ASSEMBLY-SHEET:
4113	12618-S51	COLOR MAP BOARD	A11-2 (2 OF 3)



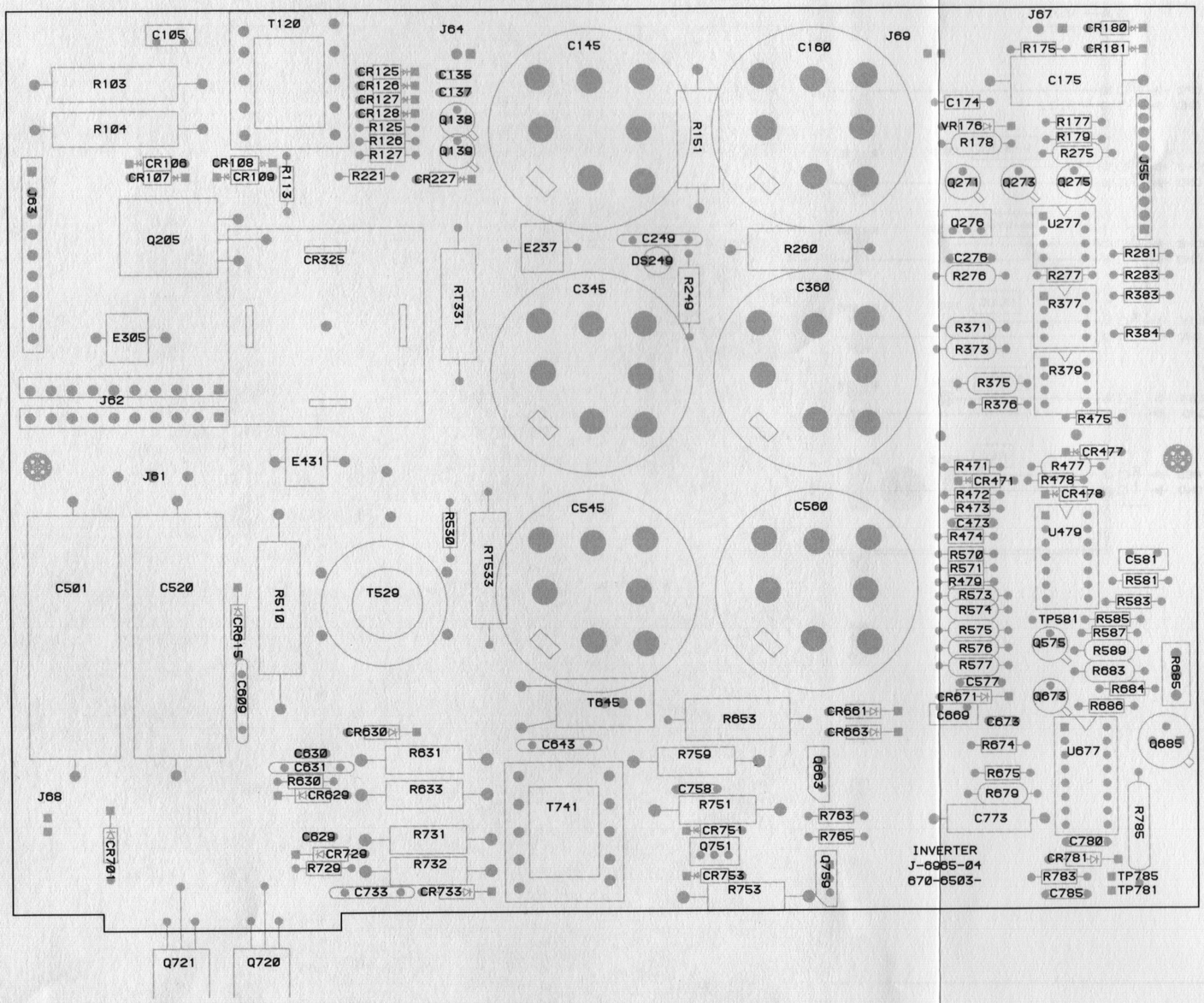
INSTRUMENT:	NOTES:		BOARD: 670-7567-00	ASSEMBLY-SHEET:
4113	☐ INDICATES SHOWN MORE THAN ONCE AND WHERE (-)	12618-S52	COLOR MAP BOARD	A11-3 (3 OF 3)



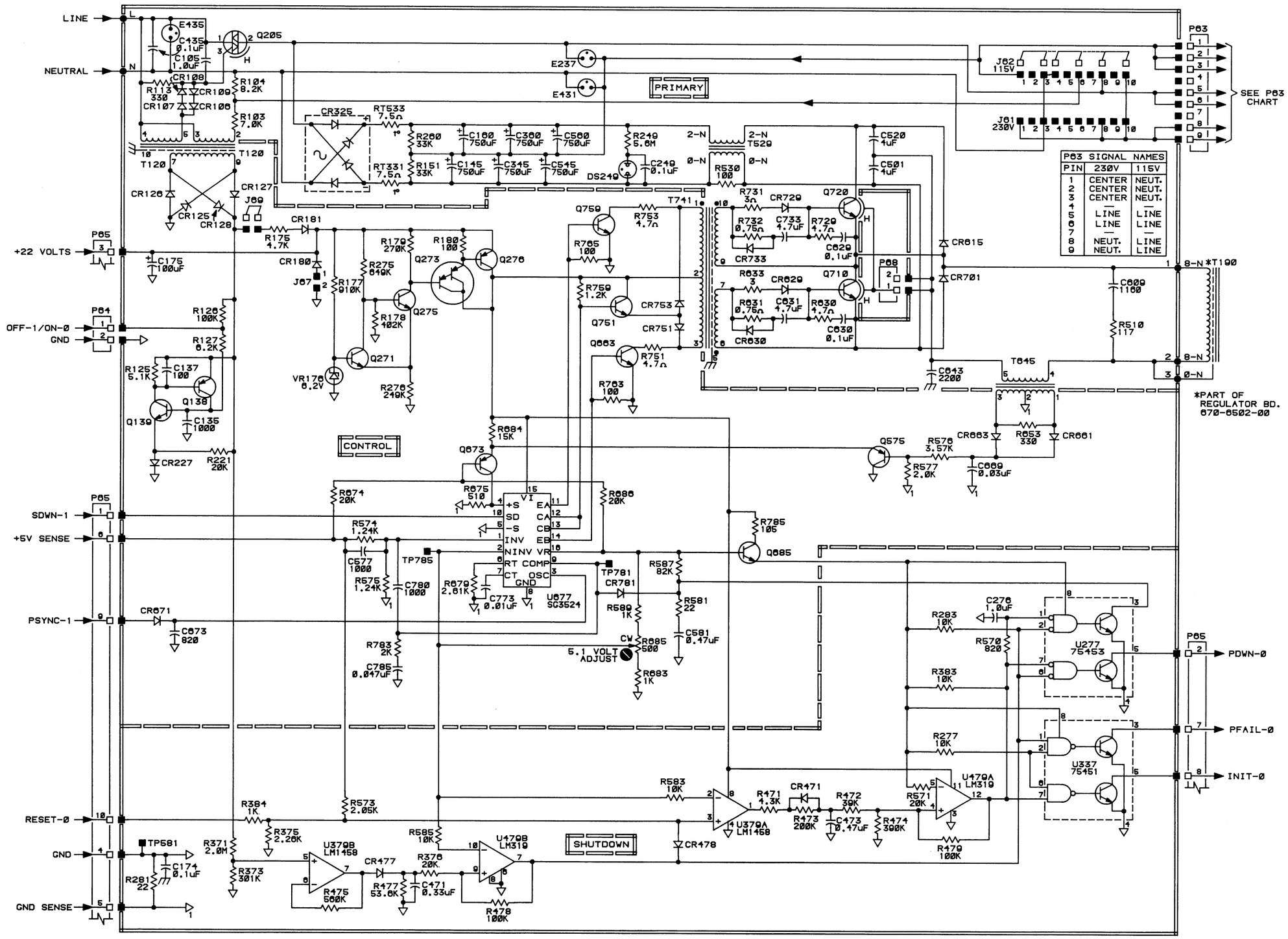
Display Interconnect Board (670-7587-00) Component Locations.



INSTRUMENT:	NOTES:	BOARD: 670-7587-00	ASSEMBLY-SHEET:
4113	12618-S53	DISPLAY INTERCONNECT BOARD	A12-1 (1 OF 1)

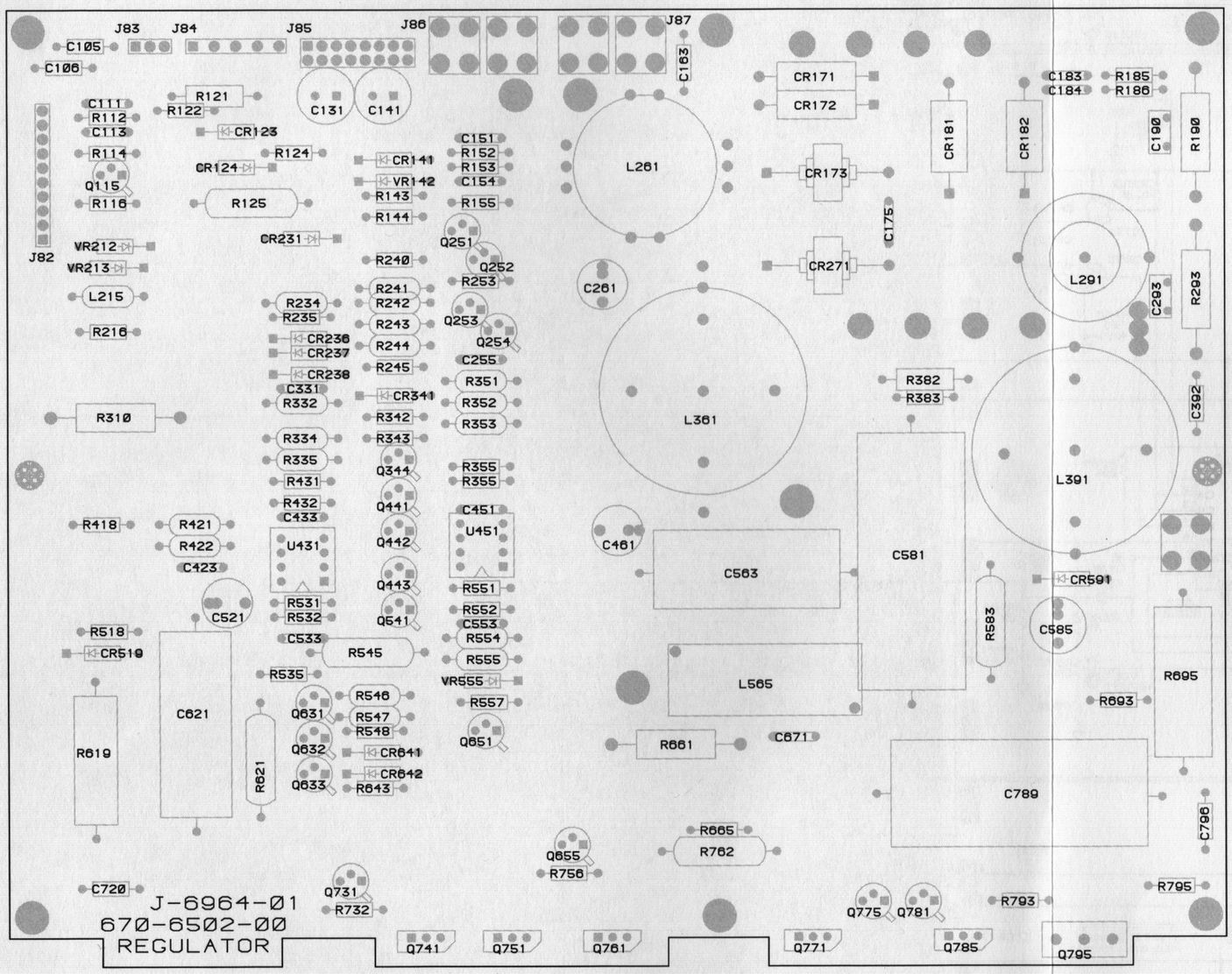


Inverter Board (670-6503-03) Component Locations.

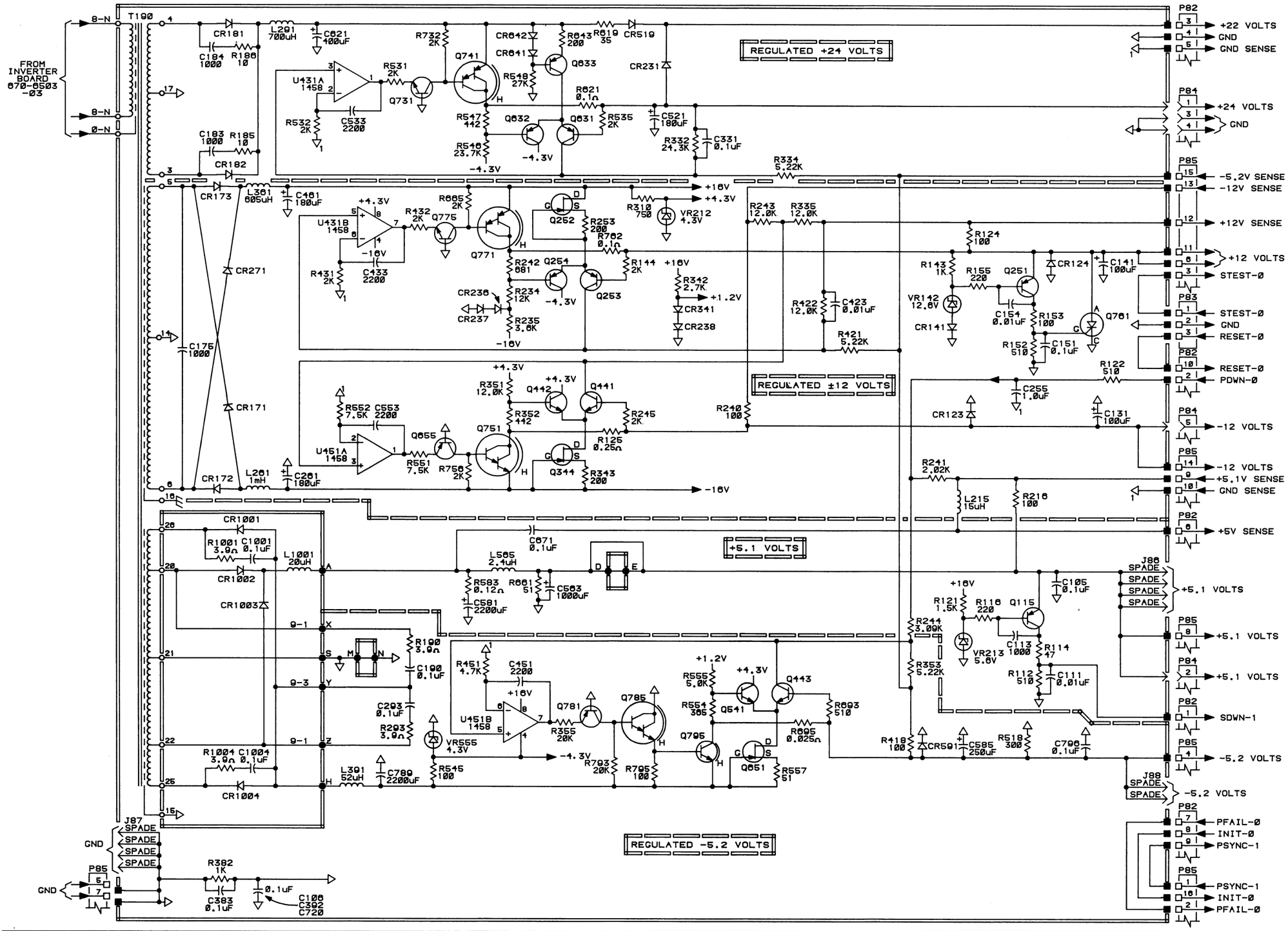


INSTRUMENT:	NOTES:	BOARD: 670-6503-03	ASSEMBLY-SHEET:
620-0294-01 (FOR USE WITH 4113)	12616-S54	INVERTER BOARD	A13A1-1 (1 OF 1)

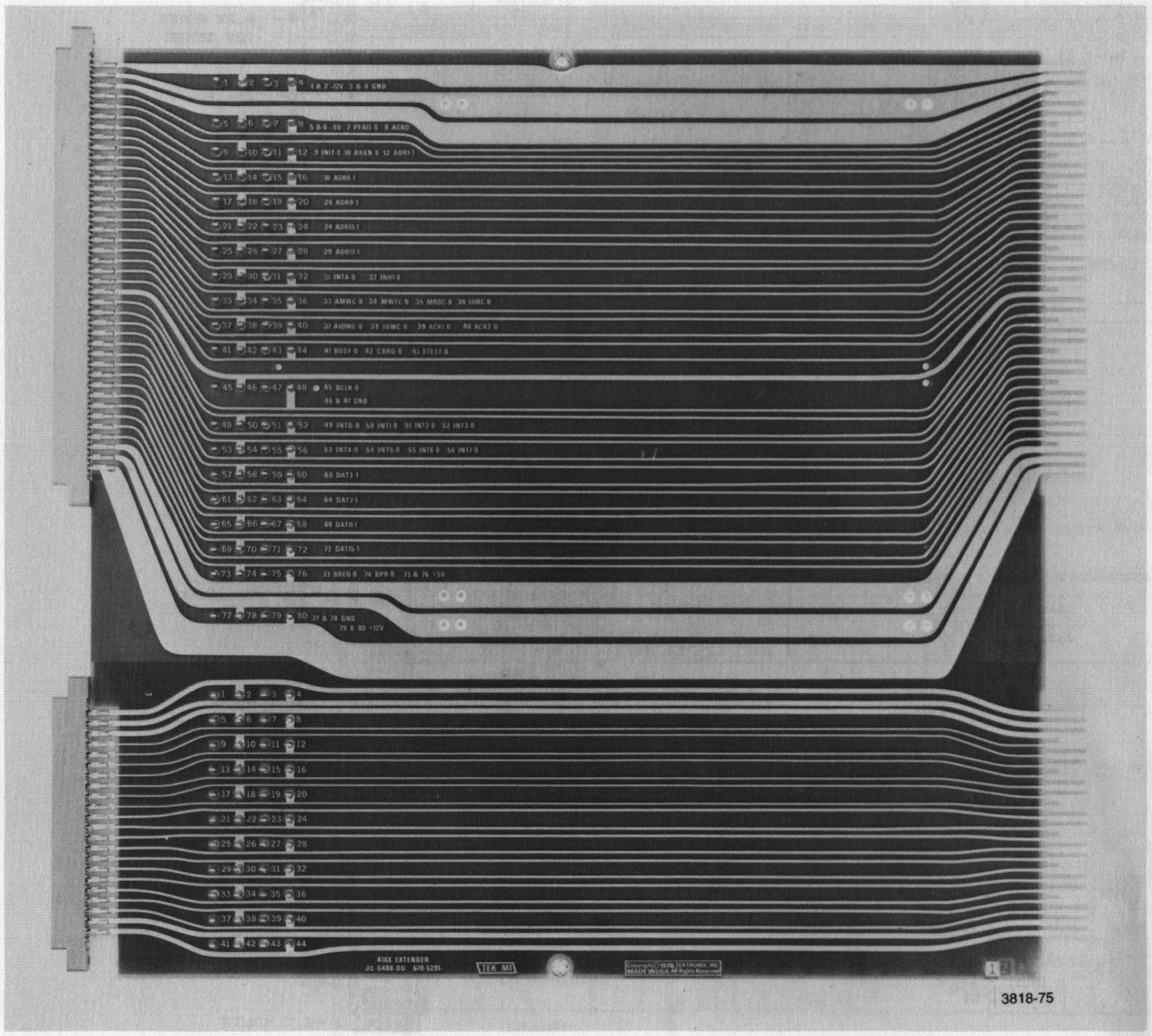
TI90 MOUNTED ON BACK



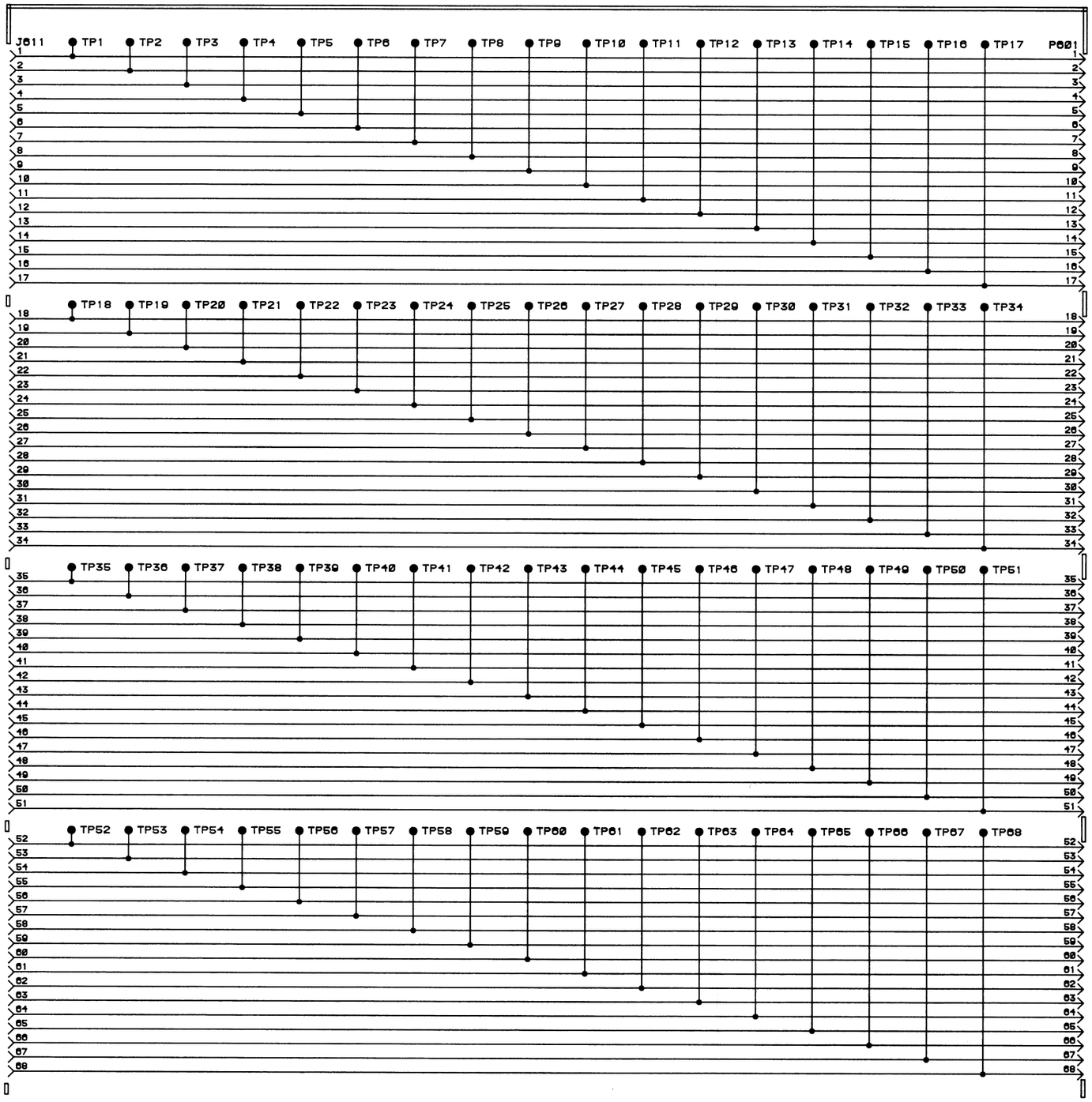
Regulator Board (670-6502-00) Component Locations.



INSTRUMENT:	NOTES:	BOARD: 670-6502-00	ASSEMBLY-SHEET:
620-0294-01 (FOR USE WITH 4113)	12618-S55	REGULATOR BOARD	A13A2-1 (1 OF 1)

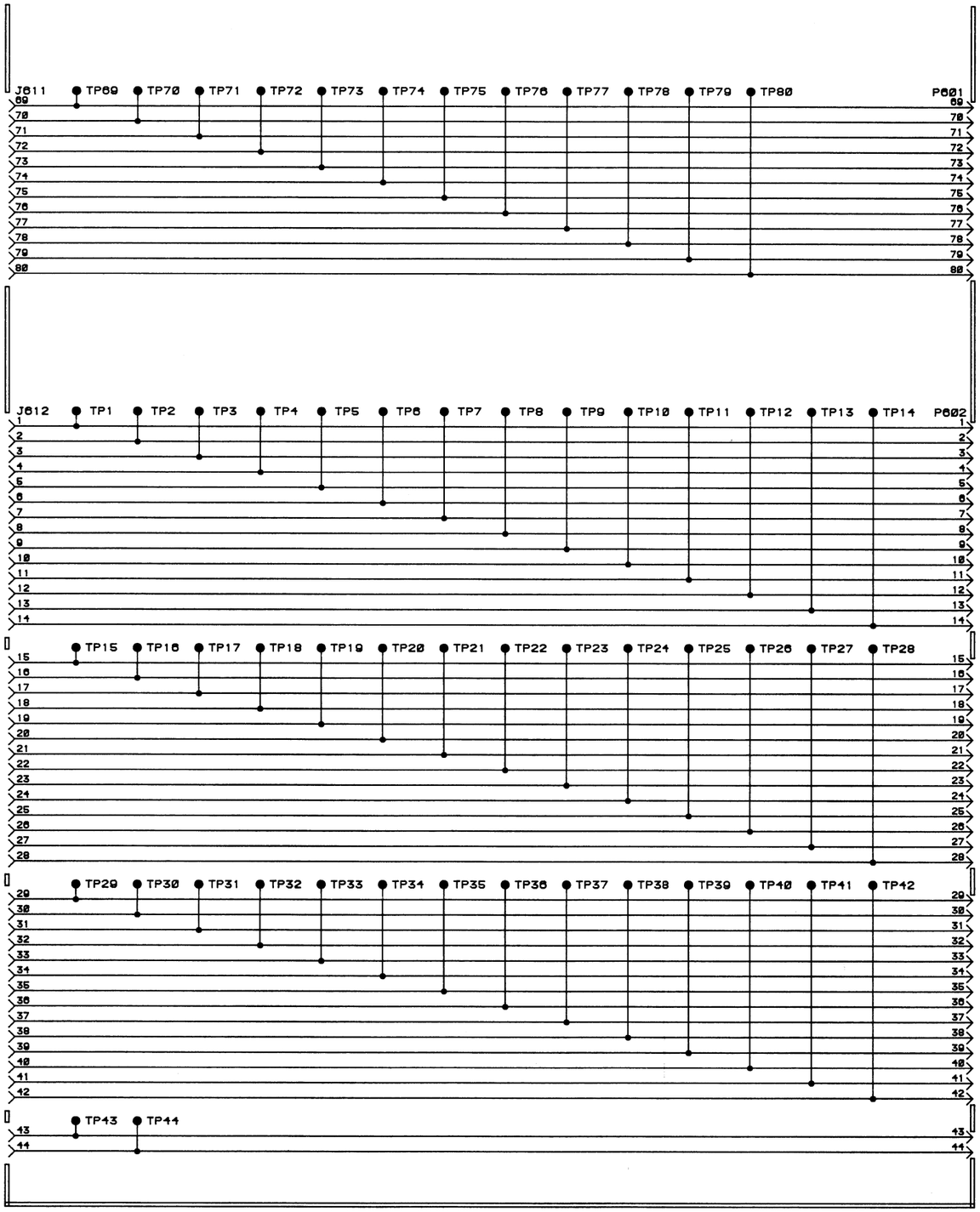


067-1005-00 41XX Logic Extender Board Component Locations.


J611
P601
TP1 TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP9 TP10 TP11 TP12 TP13 TP14 TP15 TP16 TP17
TP18 TP19 TP20 TP21 TP22 TP23 TP24 TP25 TP26 TP27 TP28 TP29 TP30 TP31 TP32 TP33 TP34
TP35 TP36 TP37 TP38 TP39 TP40 TP41 TP42 TP43 TP44 TP45 TP46 TP47 TP48 TP49 TP50 TP51
TP52 TP53 TP54 TP55 TP56 TP57 TP58 TP59 TP60 TP61 TP62 TP63 TP64 TP65 TP66 TP67 TP68

J21 THRU J29	J30	J31 THRU J38
-12 VOLTS	-12 VOLTS	-12 VOLTS
-12 VOLTS	-12 VOLTS	-12 VOLTS
GND	GND	GND
GND	GND	GND
-5.2 VOLTS	-5.2 VOLTS	-5.2 VOLTS
-5.2 VOLTS	-5.2 VOLTS	-5.2 VOLTS
PFAIL-Ø	PSYNC-1	PSYNC-1
AGND	NRFND-Ø	NRFND-Ø
INIT-Ø	INIT-Ø	INIT-Ø
BHEN-Ø	VGADR-Ø	VGADR-Ø
ADRØ-1	VBUSY-Ø	VBUSY-Ø
ADR1-1	ADR1-1	ADR1-1
ADR2-1	ADR2-1	ADR2-1
ADR3-1	ADR3-1	ADR3-1
ADR4-1	ADR4-1	ADR4-1
ADR5-1	ADR5-1	ADR5-1
ADR6-1	ADR6-1	ADR6-1
ADR7-1	ADR7-1	ADR7-1
ADR8-1	ADR8-1	ADR8-1
ADR9-1	ADR9-1	ADR9-1
ADR1Ø-1	ADR1Ø-1	ADR1Ø-1
ADR11-1	ADR11-1	SPARE
ADR12-1	ADR12-1	SPARE
ADR13-1	ADR13-1	SPARE
ADR14-1	ADR14-1	SPARE
ADR15-1	ADR15-1	SPARE
ADR16-1	IORC-Ø	IORC-Ø
ADR17-1	AIOWC-Ø	AIOWC-Ø
ADR18-1	IOWC-Ø	IOWC-Ø
ADR19-1	ACK1-Ø	SPARE
INTA-Ø	ACK2-Ø	HSYNC-Ø
INH-Ø	STEST-Ø	STEST-Ø
AMWC-Ø	GND	GND
MWTC-Ø	GND	GND
MRDC-Ø	MXØ-1	MXØ-1
IORC-Ø	MX1-1	MX1-1
AIOWC-Ø	MX2-1	MX2-1
IOWC-Ø	MX3-1	MX3-1
ACK1-Ø	MX4-1	MX4-1
ACK2-Ø	MYØ-1	MYØ-1
BUSY-Ø	MY1-1	MY1-1
CBRQ-Ø	MY2-1	MY2-1
STEST-Ø	MY3-1	MY3-1
SPARE	MY4-1	MY4-1
BCLK-Ø	MY5-1	MY5-1
GND	MY6-1	MY6-1
GND	MY7-1	MY7-1
SPARE	MY8-1	MY8-1
INTØ-Ø	N.C.	MPØ-Ø
INT1-Ø	INT6-Ø	MP1-Ø
INT2-Ø	HSYNC-Ø	MP2-Ø
INT3-Ø	N.C.	MP3-Ø
INT4-Ø	N.C.	MP4-Ø
INT5-Ø	N.C.	PWRT-Ø
INT6-Ø	GND	GND
INT7-Ø	GND	GND
DATØ-1	DATØ-1	DATØ-1
DAT1-1	DAT1-1	DAT1-1
DAT2-1	DAT2-1	DAT2-1
DAT3-1	DAT3-1	DAT3-1
DAT4-1	DAT4-1	DAT4-1
DAT5-1	DAT5-1	DAT5-1
DAT6-1	DAT6-1	DAT6-1
DAT7-1	DAT7-1	DAT7-1
DAT8-1	DAT8-1	DAT8-1
DAT9-1	DAT9-1	DAT9-1
DAT1Ø-1	DAT1Ø-1	DAT1Ø-1
DAT11-1	DAT11-1	DAT11-1

INSTRUMENT:	NOTES:	BOARD: 670-5291-00	ASSEMBLY/SHEET:
067-1005-00 (FOR USE WITH 4113)	12618-556	41XX LOGIC EXTENDER BD.	A14-1 (1 OF 2)



J21 THRU J29	J30	J31 THRU J38
DAT12-1	DAT12-1	DAT12-1
DAT13-1	DAT13-1	DAT13-1
DAT14-1	DAT14-1	DAT14-1
DAT15-1	DAT15-1	DAT15-1
* BREQ-Ø	SACK-Ø	SACK-Ø
* BPRN-Ø	EQUAL-1	EQUAL-1
+5 VOLTS	+5 VOLTS	+5 VOLTS
+5 VOLTS	+5 VOLTS	+5 VOLTS
GND	GND	GND
GND	GND	GND
+12 VOLTS	+12 VOLTS	+12 VOLTS
+12 VOLTS	+12 VOLTS	+12 VOLTS

*J29-73 & 74 = N.C.

J41 AND J42	J43 THRU J47
GND	GND
GND	GND
-5.2 VOLTS	-5.2 VOLTS
-5.2 VOLTS	-5.2 VOLTS
-2 VOLTS	-2 VOLTS
-2 VOLTS	-2 VOLTS
COL-1	COL-1
RAS-1	RAS-1
CAS-1	CAS-1
WR-1	WR-1
DCLK-1	DCLK-1
LOAD-1	LOAD-1
VIDØ-1	VIDØ-1
VID1-1	VID1-1
VID2-1	VID2-1
CURSOR-1	CURSOR-1
VID3-1	VID3-1
DAC1-1	DAC1-1
DAC2-1	DAC2-1
DAC3-1	DAC3-1
SCANSYNC-1	SCANSYNC-1
TBLANK-1	TBLANK-1
VACK-Ø	VACK-Ø
VENB-Ø	VENB-Ø
VRQST-Ø	VRQST-Ø
REF-Ø	REF-Ø
PDATØ-Ø	PDATØ-Ø
PDAT1-Ø	PDAT1-Ø
PDAT2-Ø	PDAT2-Ø
XLOAD-Ø	PDAT3-Ø
VCLK-Ø	VCLK-Ø
5ØHz-Ø	5ØHz-Ø
VDRIVE-Ø	VDRIVE-Ø
XEN-Ø	XEN-Ø
XVSYNC-Ø	XVSYNC-Ø
XHSYNC-Ø	XHSYNC-Ø
MODEØ-Ø	MODEØ-Ø
MODE1-Ø	MODE1-Ø
TEST-Ø	TEST-Ø
MAP-Ø	MAP-Ø
-5.2 VOLTS	-5.2 VOLTS
-5.2 VOLTS	-5.2 VOLTS
GND	GND
GND	GND

INSTRUMENT:	NOTES:	BOARD: 670-5291-00	ASSEMBLY/SHEET:
067-1005-00 (FOR USE WITH 4113)	12618-S57	41XX LOGIC EXTENDER BD.	A14-2 (2 OF 2)

Section 6
REPLACEABLE MECHANICAL PARTS

PARTS ORDERING INFORMATION

Replacement parts are available from or through your local Tektronix, Inc. Field Office or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available, and to give you the benefit of the latest circuit improvements developed in our engineering department. It is therefore important, when ordering parts, to include the following information in your order: Part number, instrument type or number, serial number, and modification number if applicable.

If a part you have ordered has been replaced with a new or improved part, your local Tektronix, Inc. Field Office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

SPECIAL NOTES AND SYMBOLS

X000	Part first added at this serial number
00X	Part removed after this serial number

FIGURE AND INDEX NUMBERS

Items in this section are referenced by figure and index numbers to the illustrations.

INDENTATION SYSTEM

This mechanical parts list is indented to indicate item relationships. Following is an example of the indentation system used in the description column.

1 2 3 4 5 Name & Description

Assembly and/or Component
Attaching parts for Assembly and/or Component
- - - * - - -
Detail Part of Assembly and/or Component
Attaching parts for Detail Part
- - - * - - -
Parts of Detail Part
Attaching parts for Parts of Detail Part
- - - * - - -

Attaching Parts always appear in the same indentation as the item it mounts, while the detail parts are indented to the right. Indented items are part of, and included with, the next higher indentation. The separation symbol - - - * - - - indicates the end of attaching parts.

Attaching parts must be purchased separately, unless otherwise specified.

ITEM NAME

In the Parts List, an Item Name is separated from the description by a colon (:). Because of space limitations, an Item Name may sometimes appear as incomplete. For further Item Name identification, the U.S. Federal Cataloging Handbook H6-1 can be utilized where possible.

ABBREVIATIONS

"	INCH
#	NUMBER SIZE
ACTR	ACTUATOR
ADPTR	ADAPTER
ALIGN	ALIGNMENT
AL	ALUMINUM
ASSEM	ASSEMBLED
ASSY	ASSEMBLY
ATTEN	ATTENUATOR
AWG	AMERICAN WIRE GAGE
BD	BOARD
BRKT	BRACKET
BRS	BRASS
BRZ	BRONZE
BSHG	BUSHING
CAB	CABINET
CAP	CAPACITOR
CER	CERAMIC
CHAS	CHASSIS
CKT	CIRCUIT
COMP	COMPOSITION
CONN	CONNECTOR
COV	COVER
CPLG	COUPLING
CRT	CATHODE RAY TUBE
DEG	DEGREE
DWR	DRAWER
ELCTRN	ELECTRON
ELEC	ELECTRICAL
ELCTLT	ELECTROLYTIC
ELEM	ELEMENT
EPL	ELECTRICAL PARTS LIST
EQPT	EQUIPMENT
EXT	EXTERNAL
FIL	FILLISTER HEAD
FLEX	FLEXIBLE
FLH	FLAT HEAD
FLTR	FILTER
FR	FRAME or FRONT
FSTNR	FASTENER
FT	FOOT
FXD	FIXED
GSKT	GASKET
HDL	HANDLE
HEX	HEXAGON
HEX HD	HEXAGONAL HEAD
HEX SOC	HEXAGONAL SOCKET
HLCPS	HELICAL COMPRESSION
HLEXT	HELICAL EXTENSION
HV	HIGH VOLTAGE
IC	INTEGRATED CIRCUIT
ID	INSIDE DIAMETER
IDENT	IDENTIFICATION
IMPLR	IMPELLER
IN	INCH
INCAND	INCANDESCENT
INSUL	INSULATOR
INTL	INTERNAL
LPHLDR	LAMPHOLDER
MACH	MACHINE
MECH	MECHANICAL
MTG	MOUNTING
NIP	NIPPLE
NON WIRE	NOT WIRE WOUND
OBD	ORDER BY DESCRIPTION
OD	OUTSIDE DIAMETER
OVH	OVAL HEAD
PH BRZ	PHOSPHOR BRONZE
PL	PLAIN or PLATE
PLSTC	PLASTIC
PN	PART NUMBER
PNH	PAN HEAD
PWR	POWER
RCPT	RECEPTACLE
RES	RESISTOR
RGD	RIGID
RLF	RELIEF
RTNR	RETAINER
SCH	SOCKET HEAD
SCOPE	OSCILLOSCOPE
SCR	SCREW
SE	SINGLE END
SECT	SECTION
SEMICOND	SEMICONDUCTOR
SHLD	SHIELD
SHLDR	SHOULDERED
SKT	SOCKET
SL	SLIDE
SLFLKG	SELF-LOCKING
SLVG	SLEEVING
SPR	SPRING
SQ	SQUARE
SST	STAINLESS STEEL
STL	STEEL
SW	SWITCH
T	TUBE
TERM	TERMINAL
THD	THREAD
THK	THICK
TNSN	TENSION
TPG	TAPPING
TRH	TRUSS HEAD
V	VOLTAGE
VAR	VARIABLE
W/	WITH
WSHR	WASHER
XFMR	TRANSFORMER
XSTR	TRANSISTOR

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
S3109	C/O PANEL COMPONENTS CORP.	P.O. BOX 6626	SANTA ROSA, CA 95406
S3629	PANEL COMPONENTS CORP.	2015 SECOND ST.	BERKELEY, CA 94170
000EP	AROW FASTENERS INC.	2112 AMERICAN AVENUE	HAYWARD, CA 94545
000IH	P/M INDUSTRIES INC.	14320 N.W. SCIENCE PARK DR.	PORTLAND, ORE 97229
000IJ	TDK ELECTRONICS CO. LTD C/O KING ASSOCIATES	3380 VISO COURT	SANTA CLARA, CA 95050
000JA	J. PHILLIP INDUSTRIES INC.	5713 NORTHWEST HIGHWAY	CHICAGO, ILL 60646
00779	AMP, INC.	P O BOX 3608	HARRISBURG, PA 17105
02107	SPARTA MANUFACTURING COMPANY	ROUTE NO. 2, BOX 128	DOVER, OH 44622
02114	FERROXCUBE CORPORATION	PO BOX 359, MARION ROAD	SAUGERTIES, NY 12477
04919	COMPONENT MANUFACTURING SERVICE, INC.	1 COMPONENT PARK WEST	BRIDGEWATER, MA 02379
06004	BASSICK, DIVISION STEWART-WARNER CORP.	960 ATLANTIC STREET	BRIDGEPORT, CT 06602
06383	PANDUIT CORPORATION	17301 RIDGELAND	TINLEY PARK, IL 60477
08261	SPECTRA-STRIP CORP.	7100 LAMPSON AVE.	GARDEN GROVE, CA 92642
08530	RELIANCE MICA CORP.	342-39TH ST.	BROOKLYN, NY 11232
09922	BURNDY CORPORATION	RICHARDS AVENUE	NORWALK, CT 06852
11897	PLASTIGLIDE MFG. CORPORATION	P O BOX 867, 1757 STANFORD ST.	SANTA MONICA, CA 90406
12324	STAKE FASTENER CO DIV OF DUPREE INC.	9835 DUPREE ST P.O. BOX 3156	SOUTH EL MONTE, CA 91733
12327	FREEWAY CORPORATION	9301 ALLEN DRIVE	CLEVELAND, OH 44125
13103	THERMALLOY COMPANY, INC.	2021 W VALLEY VIEW LANE P O BOX 34829	DALLAS, TX 75234
16428	BELDEN CORP.	P. O. BOX 1331	RICHMOND, IN 47374
22526	BERG ELECTRONICS, INC.	YOUK EXPRESSWAY	NEW CUMBERLAND, PA 17070
24931	SPECIALITY CONNECTOR CO., INC.	2620 ENDRESS PLACE	GREENWOOD, IN 46142
27264	MOLEX PRODUCTS CO.	5224 KATRINE AVE.	DOWNERS GROVE, IL 60515
28520	HEYMAN MFG. CO.	147 N. MICHIGAN AVE.	KENILWORTH, NJ 07033
29598	BIC PEN CORPORATION	WILEY STREET	MILFORD, CT 06460
34785	DEK INC.	1555 HAWTHORNE LN.	W CHICAGO, IL 60185
51181	KEYTRONICS INC.	707 NORTH ST.	ENDICOTT, NY 13760
52833	KEYTRONIC CORP., OCR DIV.	SPOKANE INDUSTRIAL PK., P. O. BOX 14687	SPOKANE, WA 99214
59730	THOMAS AND BETTS COMPANY	36 BUTLER ST.	ELIZABETH, NJ 07207
70903	BELDEN CORP.	2000 S BATAVIA AVENUE	GENEVA, IL 60134
71279	CAMBRIDGE THERMIONIC CORP.	445 CONCORD AVE.	CAMBRIDGE, MA 02138
71468	ITT CANNON ELECTRIC	666 E. DYER RD.	SANTA ANA, CA 92702
73743	FISCHER SPECIAL MFG. CO.	446 MORGAN ST.	CINCINNATI, OH 45206
75497	LAMSON AND SESSIONS CO.	5000 TIEDEMAN ROAD	CLEVELAND, OH 44144
77250	PHEOLL MANUFACTURING CO., DIVISION OF ALLIED PRODUCTS CORP.	5700 W. ROOSEVELT RD.	CHICAGO, IL 60650
77342	AMF INC., POTTER AND BRUMFIELD DIV.	200 RICHLAND CREEK DRIVE	PRINCETON, IN 47670
78189	ILLINOIS TOOL WORKS, INC. SHAKEPROOF DIVISION	ST. CHARLES ROAD	ELGIN, IL 60120
80009	TEKTRONIX, INC.	P O BOX 500	BEAVERTON, OR 97077
80126	PACIFIC ELECTRICORD CO.	747 W. REDONDO BEACH,P O BOX 10	GARDENA, CA 90247
82877	ROTRON, INC.	7-9 HASBROUCK LANE	WOODSTOCK, NY 12498
83309	ELECTRICAL SPECIALITY CO., SUBSIDIARY OF BELDEN CORP.	213 E. HARRIS AVE. SOUTH	SAN FRANCISCO, CA 94080
83385	CENTRAL SCREW CO.	2530 CRESCENT DR.	BROADVIEW, IL 60153
85471	BOYD, A. B., CO.	2527 GRANT AVENUE	SAN LEANDRO, CA 94579
86044	CALIFORNIA GASKET COMPANY	1601 W. 134 STREET	GARDENA, CA 90249
86445	PENN FIBRE AND SPECIALTY CO., INC.	2032 E. WESTMORELAND ST.	PHILADELPHIA, PA 19134
86928	SEASTROM MFG. COMPANY, INC.	701 SONORA AVENUE	GLENDALE, CA 91201
87308	N. L. INDUSTRIES, INC., SOUTHERN SCREW DIV.	P. O. BOX 1360	STATESVILLE, NC 28677
89663	REESE, J. RAMSEY, INC.	71 MURRAY STREET	NEW YORK, NY 10007
95987	WECKESSER CO., INC.	4444 WEST IRVING PARK RD.	CHICAGO, IL 60641
98159	RUBBER TECK, INC.	19115 HAMILTON AVE., P O BOX 389	GARDENA, CA 90247

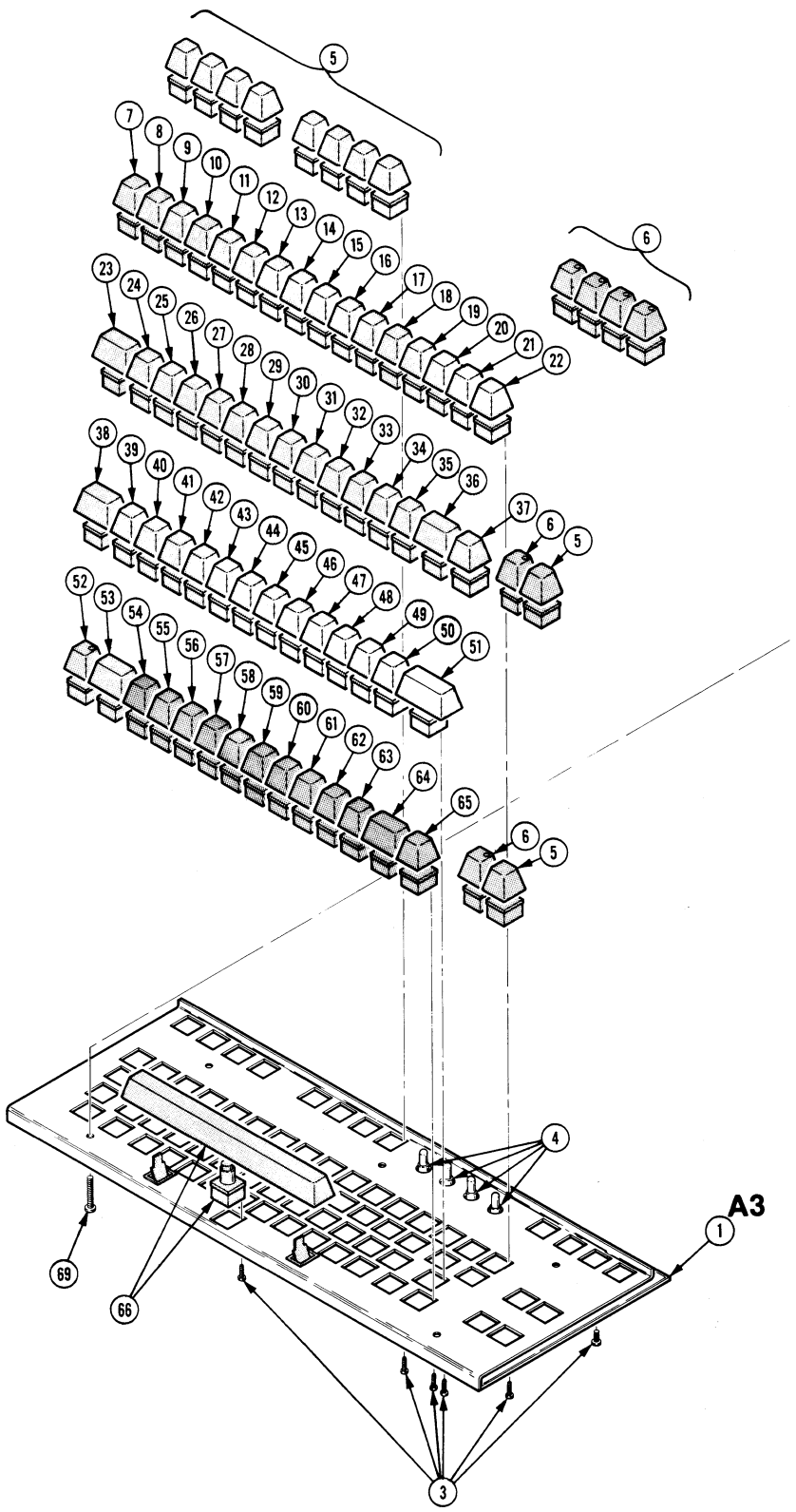
Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-1	----- -----			1		KEYBOARD ASSEMBLY:(SEE A3 REPL)		
						(ATTACHING PARTS)		
-2	210-0457-00			12		NUT,PL,ASSEM WA:6-32 X 0.312 INCH,STL	83385	OBD
						- - - * - - -		
	----- -----			-		KEYBOARD ASSY INCLUDES:		
-3	----- -----			-		. SCREWS		
-4	118-0968-00			1		. SPACER,LED:	51181	47-C0198-007
-5	366-1884-00			10		. PUSH BUTTON:EARTH BROWN,BLANK	52833	CZCZ01R110900000
	260-2062-00			10		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3241-00			10		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-6	366-1942-00			6		. PUSH BUTTON:EARTH BROWN,BLANK	52833	CZRS92R110902043
	260-2061-00			6		. SW,CAPACITIVE:LOW PROFILE	52833	61-04005-001
	214-3240-00			6		. SPRING,HLCPS:0.31 ID X 0.64 L	52833	45-00021-060
-7	366-1883-00			1		. PUSH BUTTON:EARTH BROWN,RESET OVER PAGE	52833	CZWW01T1P5240701
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3241-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-8	366-1940-00			1		. PUSH BUTTON:SMOKE TAN,LEFT BRACE	52833	CYBB01T110850802
	366-2010-00			1		. PUSH BUTTON:SMOKE TAN,L TACK/R TACK/BRA	52833	CYXD01T196703439
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-9	366-1939-00			1		. PUSH BUTTON:SMOKE TAN,! OVER 1	52833	CYBB01T137010801
	366-1961-00			1		. PUSH BUTTON:SMOKE TAN,DIARESIS/1/	52833	CYXD01T134013440
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-10	366-1938-00			1		. PUSH BUTTON:SMOKE TAN,@ OVER 2	52833	CYBB01T137220801
	366-1960-00			1		. PUSH BUTTON:SMOKE TAN,-/2/&	52833	CYXD01T134023987
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-11	366-1937-00			1		. PUSH BUTTON:SMOKE TAN,# OVER 3	52833	CYBB01T137030801
	366-1943-00			1		. PUSH BUTTON:SMOKE TAN,UNITED KINGDOM	52833	CYBB01T136930801
	----- -----			-		. (OPTION 4A ONLY)		
	366-1962-00			1		. PUSH BUTTON:SMOKE TAN,</3/#	52833	CYXD01T126503441
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-12	366-1936-00			1		. PUSH BUTTON:SMOKE TAN,# OVER 4	52833	CYBB01T137040801
	366-1963-00			1		. PUSH BUTTON:SMOKE TAN,EQUAL TO OR LESS	52833	CYXD01T126513441
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-13	366-1889-00			1		. PUSH BUTTON:SMOKE TAN,% OVER 5	52833	CYBB01T137050801
	366-1964-00			1		. PUSH BUTTON:SMOKE TAN,=/5/%	52833	CYXD01T134053441
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-14	366-1935-00			1		. PUSH BUTTON:SMOKE TAN,CARET OVER 6	52833	CYBB01T136160801
	366-1965-00			1		. PUSH BUTTON:SMOKE TAN,EQUAL TO OR GREAT	52833	CYXD01T134063441
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-15	366-1934-00			1		. PUSH BUTTON:SMOKE TAN,& OVER 7	52833	CYBB01T137270801
	366-1966-00			1		. PUSH BUTTON:SMOKE TAN,>/>/&	52833	CYXD01T128253441
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-16	366-1933-00			1		. PUSH BUTTON:SMOKE TAN,* OVER 8	52833	CYBB01T137180801
	366-1970-00			1		. PUSH BUTTON:SMOKE TAN,NOT EQUAL/8/*	52833	CYXD01T134083441
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-17	366-1932-00			1		. PUSH BUTTON:SMOKE TAN,(OVER 9	52833	CYBB01T137290801
	366-1968-00			1		. PUSH BUTTON:SMOKE TAN,OR/9/(	52833	CYXD01T118313441
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-18	366-1931-00			1		. PUSH BUTTON:SMOKE TAN,) OVER 0	52833	CYBB01T137900801
	366-1967-00			1		. PUSH BUTTON:SMOKE TAN,CARET/0/)		
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-19	366-1944-00			1		. PUSH BUTTON:SMOKE TAN,DASH OVER HYPHEN	52833	CYBB01T110520802
	366-1969-00			1		. PUSH BUTTON:SMOKE TAN,-/+ & UNDERSCORE		
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-20	366-1899-00			1		. PUSH BUTTON:SMOKE TAN,+ OVER =	52833	CYBB01T111270802
	366-2000-00			1		. PUSH BUTTON:SMOKE TAN,DIVISION/X/+/=		
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-21	366-1930-00			1		. PUSH BUTTON:SMOKE TAN,RIGHT BRACE	52833	CYBB01T110860802
	366-2009-00			1		. PUSH BUTTON:SMOKE TAN,& BRACE/L BRACE/R		
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-22	366-1941-00			1		. PUSH BUTTON:EARTH BROWN,RUB OUT	52833	CZWW01T1R5591101
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-23	366-1898-00			1		. PUSH BUTTON:EARTH BROWN,ESC	52833	CZWW02S1E3890701
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-24	366-1897-00			1		. PUSH BUTTON:SMOKE TAN,TILDE/BROKEN VERT	52833	CYBB01S121310802
	366-2007-00			1		. PUSH BUTTON:SMOKE TAN,DIAMOND/$/TILDE/V		
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-25	366-1929-00			1		. PUSH BUTTON:SMOKE TAN,Q	52833	CYBB01S1Q0010101
	366-1999-00			1		. PUSH BUTTON:SMOKE TAN,?/Q		
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-26	366-1928-00			1		. PUSH BUTTON:SMOKE TAN,W	52833	CYBB01S1W0010101
	366-1998-00			1		. PUSH BUTTON:SMOKE TAN,OMEGA/W		
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-27	366-1927-00			1		. PUSH BUTTON:SMOKE TAN,E	52833	CYBB01S1E0010101
	366-1997-00			1		. PUSH BUTTON:SMOKE TAN,EPSILON/E		
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-28	366-1926-00			1		. PUSH BUTTON:SMOKE TAN,R	52833	CYBB01S1R0010101
	366-2001-00			1		. PUSH BUTTON:SMOKE TAN,R40/R		
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-29	366-1925-00			1		. PUSH BUTTON:SMOKE TAN,T	52833	CYBB01S1T0010101
	366-1996-00			1		. PUSH BUTTON:SMOKE TAN,TILDE OVER T		
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-30	366-1924-00			1		. PUSH BUTTON:SMOKE TAN,Y	52833	CYBB01S1Y0010101
	366-1995-00			1		. PUSH BUTTON:SMOKE TAN,TAKE OVER Y		
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-31	366-1918-00			1		. PUSH BUTTON:SMOKE TAN,U	52833	CYBB01S1U0010101
	366-1994-00			1		. PUSH BUTTON:SMOKE TAN,DROP OVER U		
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-32	366-1919-00			1		. PUSH BUTTON:SMOKE TAN,I	52833	CYBB01S1I0010101
	366-1993-00			1		. PUSH BUTTON:SMOKE TAN,IOTA OVER I	52833	CYBB01S156311402
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
	366-1992-00			1		. PUSH BUTTON:SMOKE TAN,CIRCULAR OVER O	52833	CYBB01S156301402
	----- -----			-		. (OPTION 4E ONLY)		
-33	366-1920-00			1		. PUSH BUTTON:SMOKE TAN,O	52833	CYBB01S1OG010101
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
	366-1973-00			1		. PUSH BUTTON:SMOKE TAN,*/P	52833	CYBB01S1562P1402
	----- -----			-		. (OPTION 4E ONLY)		
-34	366-1921-00			1		. PUSH BUTTON:SMOKE TAN,P	52833	CYBB01S1P0010101
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
	366-2008-00			1		. PUSH BUTTON:SMOKE TAN,LEFT ARROW/RIGHT	52833	CYXD01S196743439
	----- -----			-		. (OPTION 4E ONLY)		
-35	366-1896-00			1		. PUSH BUTTON:SMOKE TAN,SM BACK SLASH	52833	CYBB01S182860802
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-36	366-1895-00			1		. PUSH BUTTON:EARTH BROWN,BK SPC	52833	CZWW02S1B7082105
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-37	366-1894-00			1		. PUSH BUTTON:EARTH BROWN,LINE FEED	52833	CZWW01S114791101
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-38	366-1893-00			1		. PUSH BUTTON:EARTH BROWN,TAB	52833	CZWW02R1T5990701
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-39	366-1892-00			1		. PUSH BUTTON:EARTH BROWN,CTRL	52833	CZWW01R1C3560701
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-40	366-1922-00			1		. PUSH BUTTON:SMOKE TAN,A	52833	CYBB01R1A0010101
	366-1971-00			1		. PUSH BUTTON:SMOKE TAN,SMALL ALPHA OVER A	52833	CYBB01R1563A1402
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-41	366-1923-00			1		. PUSH BUTTON:SMOKE TAN,S	52833	CYBB01R1S0010101
	366-1991-00			1		. PUSH BUTTON:SMOKE TAN,CEILING OVER S	52833	CYBB01R1563S1402
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-42	366-1914-00			1		. PUSH BUTTON:SMOKE TAN,D	52833	CYBB01R1D0010101
	366-1990-00			1		. PUSH BUTTON:SMOKE TAN,FLOOR OVER D	52833	CYBB01R1563D1402
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-43	366-1915-00			1		. PUSH BUTTON:SMOKE TAN,F	52833	CYBBD3R1F0010101
	366-1972-00			1		. PUSH BUTTON:SMOKE TAN,UNDERSCORE/F	52833	CYBBD3R1563F1402
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-44	366-1916-00			1		. PUSH BUTTON:SMOKE TAN,G	52833	CYBB01R1G0010101
	366-1989-00			1		. PUSH BUTTON:SMOKE TAN,DEL OVER G	52833	CYBB01R1563G1402
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-45	366-1917-00			1		. PUSH BUTTON:SMOKE TAN,H	52833	CYBB01R1H0010101
	366-1988-00			1		. PUSH BUTTON:SMOKE TAN,DELTA OVER H	52833	CYBB01R1563H1402
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-46	366-1911-00			1		. PUSH BUTTON:SMOKE TAN,J	52833	CYBBD3R1J0010101
	366-1987-00			1		. PUSH BUTTON:SMOKE TAN,NULL OVER J	52833	CYBBD3R1564J1402
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-47	366-1912-00			1		. PUSH BUTTON:SMOKE TAN,K	52833	CYBB01R1K0010101
	366-1986-00			1		. PUSH BUTTON:SMOKE TAN,'/K	52833	CYBB01R1K1161402
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-48	366-1913-00			1		. PUSH BUTTON:LT GRAY,L	52833	CYBB01R1L0010101
	366-1985-00			1		. PUSH BUTTON:SMOKE TAN,QUAD OVER L	52833	CYBB01R1563L1402
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-49	366-1891-00			1		. PUSH BUTTON:SMOKE TAN,:OVER;	52833	CYBB01R111290802
	366-1984-00			1		. PUSH BUTTON:SMOKE TAN,C/LEFT BRACKET/:/;	52833	CYXD01R117053439
	----- -----			-		. (OPTION 4E ONLY)		
	366-2004-01			1		. PUSH BUTTON:SMOKE TAN,O	52833	CYBB01R110100101
	----- -----			-		. (OPTION 4F ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-50	366-1902-00			1		. PUSH BUTTON:SMOKE TAN," OVER '	52833	CYBB01R111300802
	366-2002-00			1		. PUSH BUTTON:SMOKE TAN,)/RIGHT BRACKET/"/'	52833	CYXD01R117103439
	----- -----			-		. (OPTION 4E ONLY)		
	366-1974-01			1		. PUSH BUTTON:SMOKE TAN,DANISH/NORWEGIAN		
	----- -----			-		. (OPTION 4F ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-51	366-1890-00			1		. PUSH BUTTON:EARTH BROWN,RETURN	52833	CZWW05R1R5510701
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-52	366-1888-00			1		. PUSH BUTTON:EARTH BRN W/LED,CAPS LOCK	52833	CZTA0125C8946002
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3240-00			1		. SPRING,HLCPS:0.31 ID X 0.64 L	52833	45-00021-060
-53	366-1887-00			1		. PUSH BUTTON:EARTH BROWN,SHIFT	52833	CZWW02Q1S5770701
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-54	366-1901-00			1		. PUSH BUTTON:SMOKE TAN,Z	52833	CYBB01Q1Z0010101
	366-1983-00			1		. PUSH BUTTON:SMOKE TAN,IMBED OVER Z	52833	CYBB01Q1563Z1402
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-55	366-1903-00			1		. PUSH BUTTON:SMOKE TAN,X	52833	CYBB01Q1X0010101
	366-1982-00			1		. PUSH BUTTON:SMOKE TAN,INCLUSION OVER X	52833	CYBB01Q1563X1402
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-56	366-1904-00			1		. PUSH BUTTON:SMOKE TAN,C	52833	CYBB01Q1C0010101
	366-1981-00			1		. PUSH BUTTON:SMOKE TAN,INTERSECTION OVER C	52833	CYBB01Q1563C1402
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-57	366-1905-00			1		. PUSH BUTTON:SMOKE TAN,V	52833	CYBB01Q1V0010101
	366-1980-00			1		. PUSH BUTTON:SMOKE TAN,UNION OVER V	52833	CYBB01Q1563V1402
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-58	366-1906-00			1		. PUSH BUTTON:SMOKE TAN,B	52833	CYBB01Q1B0010101
	366-1979-00			1		. PUSH BUTTON:SMOKE TAN,DECODE OVER B	52833	CYBB01Q1562B1402
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-59	366-1907-00			1		. PUSH BUTTON:SMOKE TAN,N	52833	CYBB01Q1N0010101
	366-1978-00			1		. PUSH BUTTON:SMOKE TAN,ENCODE OVER N	52833	CYBB01Q1563N1402
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-60	366-1908-00			1		. PUSH BUTTON:SMOKE TAN,M	52833	CYBB01Q1M0010101
	366-1977-00			1		. PUSH BUTTON:SMOKE TAN,RESIDUE OVER M	52833	CYBB01Q1563M1402
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-61	366-1909-00			1		. PUSH BUTTON:SMOKE TAN,< OVER,	52833	CYBB01Q110340802
	366-1975-00			1		. PUSH BUTTON:SMOKE TAN,;/,/LESS THAN	52833	CYXD01Q117313440
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-62	366-1910-00			1		. PUSH BUTTON:SMOKE TAN,> OVER ,	52833	CYBB01Q110350802
	366-2003-00			1		. PUSH BUTTON:SMOKE TAN,:/./>	52833	CYXD01Q117083440
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-63	366-1886-00			1		. PUSH BUTTON:SMOKE TAN,? OVER SLASH	52833	CYBB01Q118560802
	366-1976-00			1		. PUSH BUTTON:SMOKE TAN,BACK SLASH/?	52833	CYXD01Q117093440
	----- -----			-		. (OPTION 4E ONLY)		
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-64	366-1887-00			1		. PUSH BUTTON:EARTH BROWN,SHIFT	52833	CZWW02Q1S5770701
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3337-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-65	366-1885-00			1		. PUSH BUTTON:EARTH BROWN,BREAK	52833	CZWW01Q1B3310701
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3336-00			1		. SPRING,HLCPS:0.31 ID X 0.64 L	52833	04500024060
-66	366-1900-00			1		. PUSH BUTTON:SMOKE TAN,BLANK	52833	CYCY12P110902602
	260-2062-00			1		. SW,CAPACITIVE:LOW PROFILE	52833	61-04001-001
	214-3338-00			1		. SPRING,HLCPS:0.4 ID X 0.875 L	52833	45-00021-015
-67	334-4738-00			1		OVERLAY,KYBD:		
-68	386-4861-00			1		PANEL,KEYBOARD:	80009	386-4861-00
						(ATTACHING PARTS)		
-69	211-0514-00			5		SCREW,MACHINE:6-32 X 0.750 INCH,PNH STL	83385	OBD
						- - - * - - -		
-70	----- -----			1		LOUDSPEAKER,PM:(SEE LS1001 REPL)		
						(ATTACHING PARTS)		
-71	211-0507-00			2		SCREW,MACHINE:6-32 X 0.312 INCH,PNH STL	83385	OBD
						- - - * - - -		
-72	175-3219-00			1		CA ASSY,SP,ELEC:2,26 AWG,6.0 L,RIBBON	80009	175-3219-00
-73	131-0707-00			2		. CONNECTOR,TERM:22-26 AWG,BRS& CU BE GOLD	22526	47439
-74	352-0169-00			1		. HLDR,TERM CONN:2 WIRE BLACK	80009	352-0169-00
	----- -----			-		. (A3P3)		
-75	407-2506-00			2		BRACKET,CMPNT:THUMBWHEEL,ALUMINUM	80009	407-2506-00
						(ATTACHING PARTS)		
-76	210-0457-00			4		NUT,PL,ASSEM WA:6-32 X 0.312 INCH,STL	83385	OBD
						- - - * - - -		
-77	----- -----			2		SWITCH,ROTARY:(SEE A9001,A9002 REPL CHASS PARTS)		
						(ATTACHING PARTS)		
-78	211-0244-00			4		SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH STL	78189	OBD
						- - - * - - -		
-79	175-3223-00			2		CA ASSY,SP,ELEC:4,26 AWG,4.0 L,RIBBON	80009	175-3223-00
-80	131-0707-00			16		. CONNECTOR,TERM:22-26 AWG,BRS& CU BE GOLD	22526	47439
-81	175-0827-00			AR		. CABLE,SP,ELEC:4,26 AWG,STRD,PVC JKT,RBN	08261	SS04267(1061)0C
-82	352-0162-00			4		. HLDR,TERM CONN:4 WIRE BLACK	80009	352-0162-00
	----- -----			-		. (A3P1,A3P2,THUMB WHEELS)		
-83	195-1201-00			2		. LEAD,ELECTRICAL:24 AWG,4.0 L,BRAID	80009	195-1201-00
-84	131-1216-00			1		. TERM,QIK DISC:U/W 0.25 X 0.032 TAB,BLUE	00779	42332-4
-85	210-0307-00			1		. TERMINAL,LUG:RING,INS,16-14 AWG,#8	09922	BA14E-8
-86	175-3434-00			1		. CA ASSY,SP,ELEC:20,28 AWG,72.0 L,RIBBON	22526	OBD
	----- -----			-		. (A3P4,A2A1J103)		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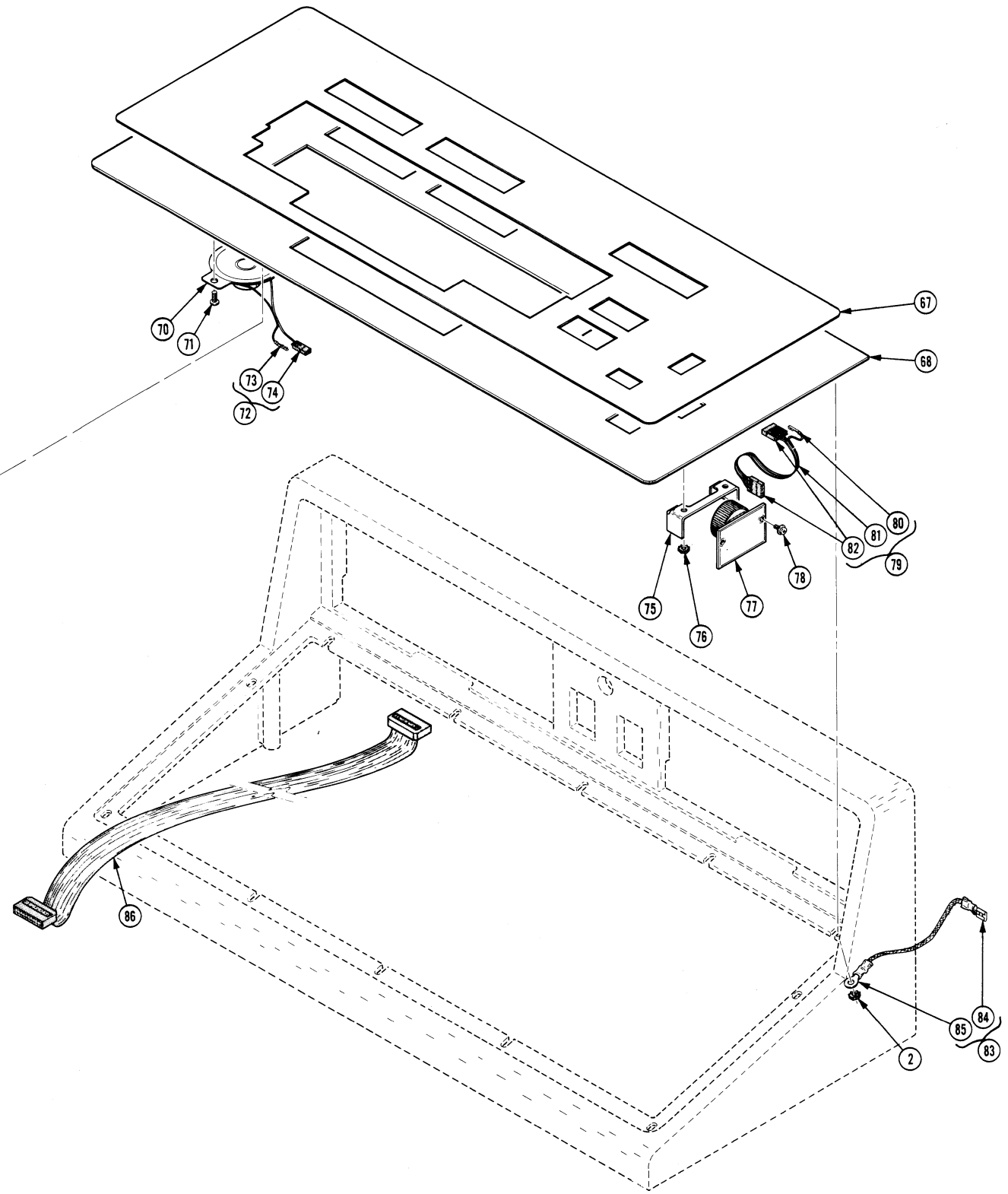

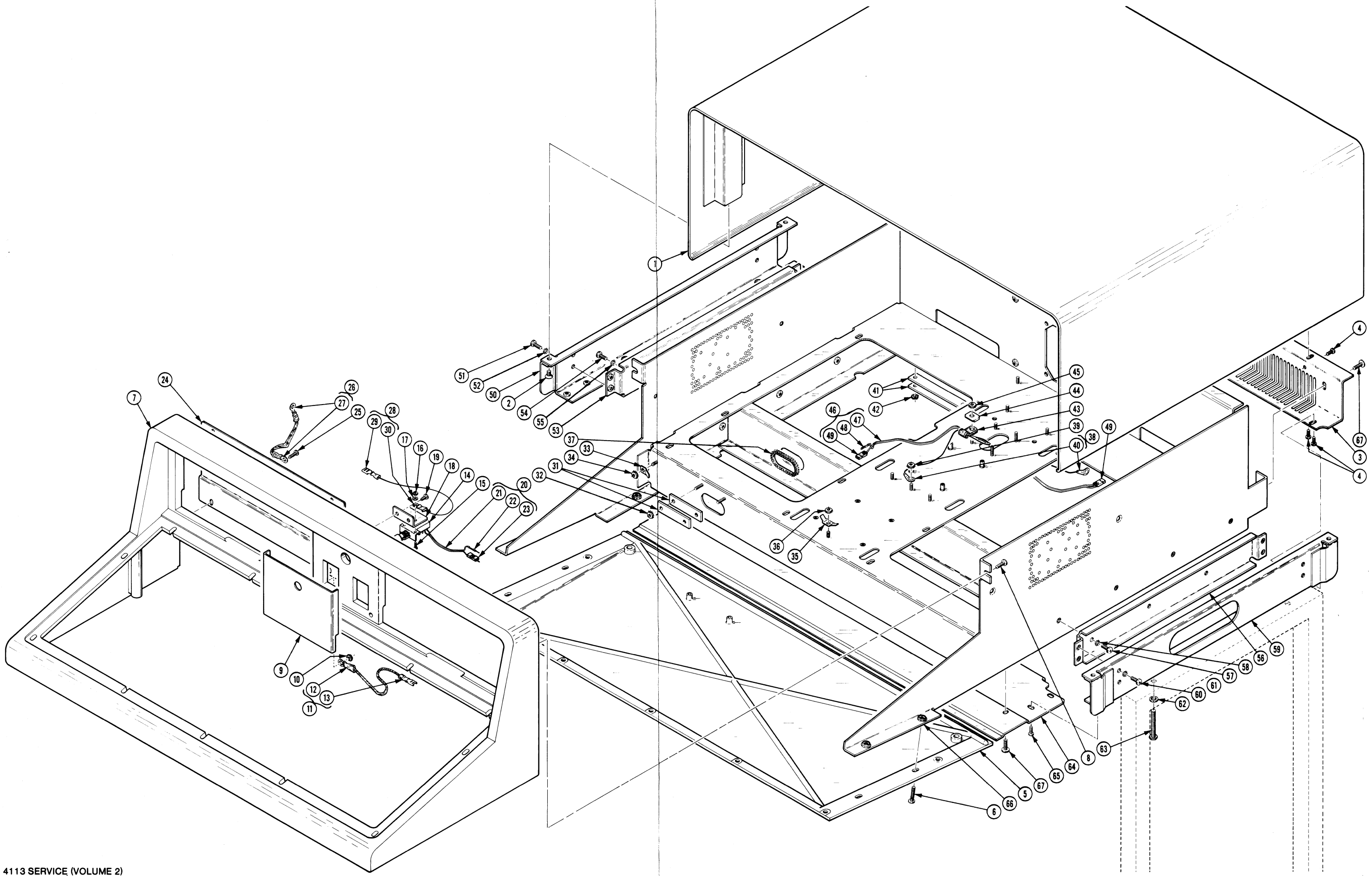
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Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
2-1	390-0795-02			1		CABINET TOP:W/STIFFENERS	80009	390-0795-02
						(ATTACHING PARTS)		
-2	212-0560-00			4		SCREW,MACHINE:10-32 X 0.312INCH,FLH STL	75497	OBD
						- - - * - - -		
-3	101-0053-01			1		TRIM,DECORATIVE:BACK COVER,ALUMINUM	80009	101-0053-01
						(ATTACHING PARTS)		
-4	211-0507-00			8		SCREW,MACHINE:6-32 X 0.312 INCH,PNH STL	83385	OBD
						- - - * - - -		
-5	200-2482-01			1		COVER,BOTTOM:	80009	200-2482-01
						(ATTACHING PARTS)		
-6	212-0033-00			13		SCREW,MACHINE:8-32 X 0.750 INCH,PNH STL	83385	OBD
						- - - * - - -		
-7	200-2502-02			1		COV,KYBD/FLOPPY:FRONT W/BEZEL	80009	200-2502-02
						(ATTACHING PARTS)		
-8	212-0023-00			2		SCREW,MACHINE:8-32 X 0.375 INCH,PNH STL	83385	OBD
						- - - * - - -		
-9	333-2726-00			1		PANEL,FRONT:	80009	333-2726-00
						(ATTACHING PARTS)		
-10	210-0457-00			4		NUT,PL,ASSEM WA:6-32 X 0.312 INCH,STL	83385	OBD
						- - - * - - -		
-11	195-1201-00			1		LEAD,ELECTRICAL:24 AWG,4.0 L,BRAID	80009	195-1201-00
-12	210-0307-00			1		. TERMINAL,LUG:RING,INS,16-14 AWG,#8	09922	BA14E-8
-13	131-1216-00			1		. TERM,QIK DISC:U/W 0.25 X 0.032 TAB,BLUE	00779	42332-4
-14	----- -----			1		SWITCH,PUSH:(SEE S3001 REPL CHASSIS PARTS)		
						(ATTACHING PARTS)		
-15	211-0001-00			2		SCREW,MACHINE:2-56 X 0.25 INCH,PNH STL	87308	OBD
-16	210-0405-00			2		NUT,PLAIN,HEX.:2-56 X 0.188 INCH,BRS	73743	12157-50
-17	210-0001-00			2		WASHER,LOCK:INTL,0.092 ID X 0.18"OD,STL	78189	1202-00-00-0541C
						- - - * - - -		
-18	407-2571-00			1		BRACKET,ANGLE:SWITCH,ALUMINUM	80009	407-2571-00
						(ATTACHING PARTS)		
-19	211-0504-00			2		SCREW,MACHINE:6-32 X 0.25 INCH,PNH STL	83385	OBD
						- - - * - - -		
-20	175-3370-00			1		CA ASSY,SP,ELEC:2,26 AWG,6.0 L,RIBBON	80009	175-3370-00
-21	175-0863-00			AR		. WIRE,ELECTRICAL:2 WIRE RIBBON	08261	SS-0222-7(1061)
-22	131-0965-00			2		. CONTACT,ELEC:0.25" SQ,22-26 AWG WIRE	22526	47792
-23	204-0805-00			1		. CONN BODY,PLUG:2 CONTACTS,SINGLE ROW	000IH	OBD
-24	386-4463-00			2		PLATE,COVER:0.062 X 9.188X 4.281,AL	80009	386-4463-00
						(ATTACHING PARTS)		
-25	213-0104-00			8		SCR,TPG,THD FOR:6-20 X 0.375 INCH,TRH STL	83385	OBD
						- - - * - - -		
-26	195-1617-00			2		LEAD,ELECTRICAL:2.5 L,BRAID	80009	195-1617-00
-27	210-0307-00			4		. TERMINAL,LUG:RING,INS,16-14 AWG,#8	09922	BA14E-8
-28	195-1202-00			1		LEAD,ELECTRICAL:18 AWG,6.0 L,0-N	80009	195-1202-00
-29	131-1215-00			1		. TERM,QIK DISC:U/W 0.25 X 0.032 TAB,RED	77342	42599-4
-30	210-0287-00			1		. TERMINAL,LUG:# 6 RING	00779	34142
-31	343-0893-00			2		CLAMP,CABLE:2.0 L,FIBER SHEET	85471	OBD
						(ATTACHING PARTS)		
-32	210-0457-00			2		NUT,PL,ASSEM WA:6-32 X 0.312 INCH,STL	83385	OBD
						- - - * - - -		
-33	131-1688-00			2		TERM,QIK DISC:MALE,0.032 X 0.25 BL,45 DEG	00779	42577-4
						(ATTACHING PARTS)		
-34	210-0457-00			2		NUT,PL,ASSEM WA:6-32 X 0.312 INCH,STL	83385	OBD
						- - - * - - -		
-35	131-1977-00			1		TERM,QIK DISC:MALE,0.25 W TAB	00779	42577-1
						(ATTACHING PARTS)		
-36	210-0457-00			1		NUT,PL,ASSEM WA:6-32 X 0.312 INCH,STL	83385	OBD
						- - - * - - -		
-37	255-0334-00			1		PLASTIC CHANNEL:12.75 X 0.175X 0.155,NYL	11897	122-37-2500
-38	195-0994-00			1		LEAD,ELECTRICAL:18 AWG,STR,26.0 L,5-4		
						(ATTACHING PARTS)		
-39	210-0457-00			2		NUT,PL,ASSEM WA:6-32 X 0.312 INCH,STL	83385	OBD
						- - - * - - -		

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
2-	----- -----			-		LEAD,ELEC INCLUDES:		
-40	210-0202-00			2		. TERMINAL,LUG:0.146 ID,LOCKING,BRZ TINNED	78189	2104-06-00-2520N
-41	343-0894-00			2		CLAMP,CABLE:3.5 L,FIBER SHEET	85471	OBD
						(ATTACHING PARTS)		
-42	210-0457-00			2		NUT,PL,ASSEM WA:6-32 X 0.312 INCH,STL	83385	OBD
						- - - * - - -		
-43	343-0001-00			1		CLAMP,LOOP:0.15 INCH DIA,PLASTIC	95987	1-8-6B
						(ATTACHING PARTS)		
-44	210-0863-00			1		WSHR,LOOP CLAMP:0.187 ID U/W 0.5 W CLP,STL	95987	C191
-45	210-0457-00			1		NUT,PL,ASSEM WA:6-32 X 0.312 INCH,STL	83385	OBD
						- - - * - - -		
-46	175-3351-00			1		CA ASSY,SP,ELEC:2,26 AWG, 36.0L,RIBBON	80009	175-3351-00
	----- -----			-		(S3001 TO POWER SUPPLY)		
-47	175-0825-00			AR		. WIRE,ELECTRICAL:2 WIRE RIBBON	80009	175-0825-00
-48	131-0707-00			4		. CONNECTOR,TERM:22-26 AWG,BRS& CU BE GOLD	22526	47439
-49	204-0805-00			2		. CONN BODY,PLUG:2 CONTACTS,SINGLE ROW	000IH	OBD
-50	386-4362-03			1		SPRT,CHAS TRACK:LEFT,STEEL	80009	386-4362-03
						(ATTACHING PARTS)		
-51	212-0023-00			4		SCREW,MACHINE:8-32 X 0.375 INCH,PNH STL	83385	OBD
-52	210-0007-00			4		WASHER,LOCK:#8 EXT,0.02 THK,STL CD PL	78189	1108-00-00-0541C
						- - - * - - -		
-53	407-2572-01			1		BRACKET,SUPPORT:CHASSIS,ALUMINUM	80009	407-2572-01
						(ATTACHING PARTS)		
-54	212-0023-00			3		SCREW,MACHINE:8-32 X 0.375 INCH,PNH STL	83385	OBD
-55	210-0007-00			3		WASHER,LOCK:#8 EXT,0.02 THK,STL CD PL	78189	1108-00-00-0541C
						- - - * - - -		
-56	407-2572-01			1		BRACKET,SUPPORT:CHASSIS,ALUMINUM	80009	407-2572-01
						(ATTACHING PARTS)		
-57	212-0023-00			3		SCREW,MACHINE:8-32 X 0.375 INCH,PNH STL	83385	OBD
-58	210-0007-00			3		WASHER,LOCK:#8 EXT,0.02 THK,STL CD PL	78189	1108-00-00-0541C
						- - - * - - -		
-59	386-4361-03			1		SPRT,CHAS TRACK:RIGHT,STEEL	80009	386-4361-03
						(ATTACHING PARTS)		
-60	212-0023-00			4		SCREW,MACHINE:8-32 X 0.375 INCH,PNH STL	83385	OBD
-61	210-0007-00			4		WASHER,LOCK:#8 EXT,0.02 THK,STL CD PL	78189	1108-00-00-0541C
						- - - * - - -		
-62	210-0852-00			4		WASHER,FLAT:0.188 ID X 0.091 THK,STL CD	12327	OBD
-63	212-0576-00			4		SCREW,MACHINE:10-32 X 1.375,HEX HD,STL	000EP	OBD
-64	200-2483-03			1		COVER,BOTTOM:ALUMINUM	80009	200-2483-03
						(ATTACHING PARTS)		
-65	212-0507-00			4		SCREW,MACHINE:10-32 X 0.375 INCH,PNH STL	83385	OBD
						- - - * - - -		
-66	441-1526-03			1		CHASSIS,TERM:FLOPPY DISC	80009	441-1526-03
						(ATTACHING PARTS)		
-67	212-0045-00			4		SCREW,MACHINE:8-32 X 0.500 INCH,TRH,STL	83385	OBD
						- - - * - - -		

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
3-1	200-2491-02			1		COVER,FRONT:PEDESTAL	80009	200-2491-02
						(ATTACHING PARTS)		
-2	212-0658-00			6		SCREW,MACHINE:10-32 X 0.375,PNH,STL		
						- - - * - - -		
-3	343-0714-00			2		RETAINER,COVER:	80009	343-0714-00
-4	210-0007-00			2		WASHER,LOCK:#8 EXT,0.02 THK,STL CD PL	78189	1108-00-00-0541C
-5	200-2510-01			2		COVER,SIDE:PEDESTAL	80009	200-2510-01
-6	343-0714-00			6		RETAINER,COVER:	80009	343-0714-00
-7	210-0007-00			6		WASHER,LOCK:#8 EXT,0.02 THK,STL CD PL	78189	1108-00-00-0541C
-8	101-0074-01			2		STRIP,TRIM:SIDE COVER,SLATE GRAY	80009	101-0074-01
-9	386-4372-01			1		PANEL,REAR:LOWER	80009	386-4372-01
						(ATTACHING PARTS)		
-10	212-0658-00			11		SCREW,MACHINE:10-32 X 0.375,PNH,STL	12324	SFSW10F6DSMOKE T
						- - - * - - -		
-12	212-0535-00			3		SCREW,MACHINE:10-32 X 0.312 INCH,TRH STL	83385	OBD
-13	212-0518-00			8		SCREW,MACHINE:10-32 X 0.312 INCH,PNH STL	83385	OBD
						- - - * - - -		
-14	386-4371-00			2		PANEL,BLANK:	80009	386-4371-00
						(ATTACHING PARTS)		
-15	211-0507-00			8		SCREW,MACHINE:6-32 X 0.312 INCH,PNH STL	83385	OBD
						- - - * - - -		
-16	200-1532-06			2		COVER,INTFC CAV:ALUMINUM	80009	200-1532-06
						(ATTACHING PARTS)		
-17	211-0507-00			8		SCREW,MACHINE:6-32 X 0.312 INCH,PNH STL	83385	OBD
						- - - * - - -		
-18	220-0876-00			1		NUT BAR:9.075 L X 0.25 SQ,6-32 THD	80009	220-0876-00
						(ATTACHING PARTS)		
-19	211-0507-00			3		SCREW,MACHINE:6-32 X 0.312 INCH,PNH STL	83385	OBD
						- - - * - - -		
-20	343-0915-00			2		CLAMP,LOOP:0.625 ID,NYLON	34785	030-0625
-21	386-4386-01			1		SUPPORT,FRAME:RIGHT,STEEL,SLATE GRAY	80009	386-4386-01
						(ATTACHING PARTS)		
-22	212-0520-00			8		SCREW,MACHINE:10-32 X 1.250,HEX HD,STL	83385	OBD
-23	210-0009-00			8		WASHER,LOCK:EXT,0.193ID X0.40" OD,STL	78189	1110-00
						- - - * - - -		
-24	386-4387-01			1		SUPPORT,FRAME:LEFT,STEEL,SLATE GRAY	80009	386-4387-01
						(ATTACHING PARTS)		
-25	212-0520-00			8		SCREW,MACHINE:10-32 X 1.250,HEX HD,STL	83385	OBD
-26	210-0009-00			8		WASHER,LOCK:EXT,0.193ID X0.40" OD,STL	78189	1110-00
						- - - * - - -		
-27	401-0486-00			4		CASTER,SWIVEL:60MM WHEEL,BLACK,CELON	06004	61P9XP2AA
						(ATTACHING PARTS)		
-28	212-0518-00			16		SCREW,MACHINE:10-32 X 0.312 INCH,PNH STL	83385	OBD
						- - - * - - -		
-29	----- -----			2		FAN:(SEE B1001,B1002 REPL CHASSIS PARTS)		
						(ATTACHING PARTS)		
-30	210-0457-00			8		NUT,PL,ASSEM WA:6-32 X 0.312 INCH,STL	83385	OBD
						- - - * - - -		
-31	386-4462-00			2		PLATE,FAN MTG:ALUMINUM	80009	386-4462-00
						(ATTACHING PARTS)		
-32	212-0518-00			4		SCREW,MACHINE:10-32 X 0.312 INCH,PNH STL	83385	OBD
						- - - * - - -		
-33	214-0762-00			2		GRILLE,METAL:ZINC PLATED STL	82877	20132-2
						(ATTACHING PARTS)		
-34	211-0511-00			8		SCREW,MACHINE:6-32 X 0.500,PNH,STL,CD PL	83385	OBD
-35	210-0457-00			8		NUT,PL,ASSEM WA:6-32 X 0.312 INCH,STL	83385	OBD
						- - - * - - -		
-36	175-3221-00			1		CA ASSY,SP,ELEC:2,18 AWG,11.0L,8-N	80009	175-3221-00
	----- -----			-		(USED WITH B1002)		
	175-3222-00			1		CA ASSY,SP,ELEC:2,18 AWG,6.0 L,8-N	80009	175-3222-00
	----- -----			-		(USED WITH B1001)		
	----- -----			-		EACH CABLE INCLUDES:		
-37	131-0945-00			2		. CONTACT,ELEC:CONNECTOR,BRASS TIN PL	27264	02-09-2103
-38	131-2436-00			2		. TERM,QIK DISC:18-22 AWG,FEMALE	00779	2-520083-2
-39	175-2203-00			AR		. CABLE,SP,ELEC:2,18 AWG,W/VINYL JACKET	80009	175-2203-00

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
3-40	204-0827-00			1		. CONN BODY,PLUG:2 CONT FEMALE	27264	03-09-2022
-41	255-0334-00			2		PLASTIC CHANNEL:12.75 X 0.175X 0.155,NYL	11897	122-37-2500
-42	358-0661-00			6		BSHG,MACH THD:0.5-28 X 0.393ID,AL,0.275 L	80009	358-0661-00
						(ATTACHING PARTS)		
-43	220-0859-00			6		NUT,PLAIN,HEX:5-28 THD X 0.688 HEX,STL	80009	220-0859-00
-44	210-1039-00			6		WASHER,LOCK:INT,0.521 ID X 0.625 INCH OD	24931	OBD
						- - - * - - -		
-45	200-2676-00			2		COVER,ACCESS:LINE VOLTAGE	80009	200-2676-00
						(ATTACHING PARTS)		
-46	212-0518-00			4		SCREW,MACHINE:10-32 X 0.312 INCH,PNH STL	83385	OBD
						- - - * - - -		
-47	407-2538-00			1		BRKT,POWER SPLY:ALUMINUM	80009	407-2538-00
						(ATTACHING PARTS)		
-48	212-0518-00			4		SCREW,MACHINE:10-32 X 0.312 INCH,PNH STL	83385	OBD
						- - - * - - -		
-49	343-0894-00			2		CLAMP,CABLE:3.5 L,FIBER SHEET	85471	OBD
						(ATTACHING PARTS)		
-50	210-0457-00			2		NUT,PL,ASSEM WA:6-32 X 0.312 INCH,STL	83385	OBD
						- - - * - - -		
-51	343-0893-00			2		CLAMP,CABLE:2.0 L,FIBER SHEET	85471	OBD
						(ATTACHING PARTS)		
-52	210-0457-00			2		NUT,PL,ASSEM WA:6-32 X 0.312 INCH,STL	83385	OBD
						- - - * - - -		
-53	214-3059-00			1		DEFLECTOR,AIR:PEDESTAL,AL	80009	214-3059-00
						(ATTACHING PARTS)		
-54	220-0410-00			7		NUT,EXTENDED WA:10-32 X 0.375 INCH,STL	83385	OBD
						- - - * - - -		
-55	348-0704-00			2		PAD,CUSHIONING:15.0 X 0.75 X0.25,SIL RBR	85471	OBD
-56	407-2523-00			1		BRACKET,CMPNT:RESET SWITCH,AL	80009	407-2523-00
						(ATTACHING PARTS)		
-57	212-0518-00			2		SCREW,MACHINE:10-32 X 0.312 INCH,PNH STL	83385	OBD
						- - - * - - -		
-58	343-0914-00			2		CLAMP,LOOP:0.5 X 2.5,NYLON	34785	034-0500
-59	348-0442-00			2		GROMMET,PLASTIC:BLACK,ROUND,0.375" ID	28520	SB-500-6
-60	175-3670-00			1		CA ASSY,SP,ELEC:3,26 AWG,11.0L,RIBBON	80009	175-3670-00
-61	175-0826-00			1		. WIRE,ELECTRICAL:3 WIRE RIBBON	80009	175-0826-00
-62	131-0707-00			3		. CONNECTOR,TERM:22-26 AWG,BRS& CU BE GOLD	22526	47439
-63	352-0161-00			1		. HLDR,TERM CONN:3 WIRE,BLACK	80009	352-0161-00
-64	386-4391-00			1		PANEL ASSY,PED:	80009	386-4391-00
-65	386-4370-00			1		PLATE,MOUNTING:HEAT SINK,AL	80009	386-4370-00
						(ATTACHING PARTS)		
-66	211-0511-00			2		SCREW,MACHINE:6-32 X 0.500,PNH,STL,CD PL	83385	OBD
						- - - * - - -		

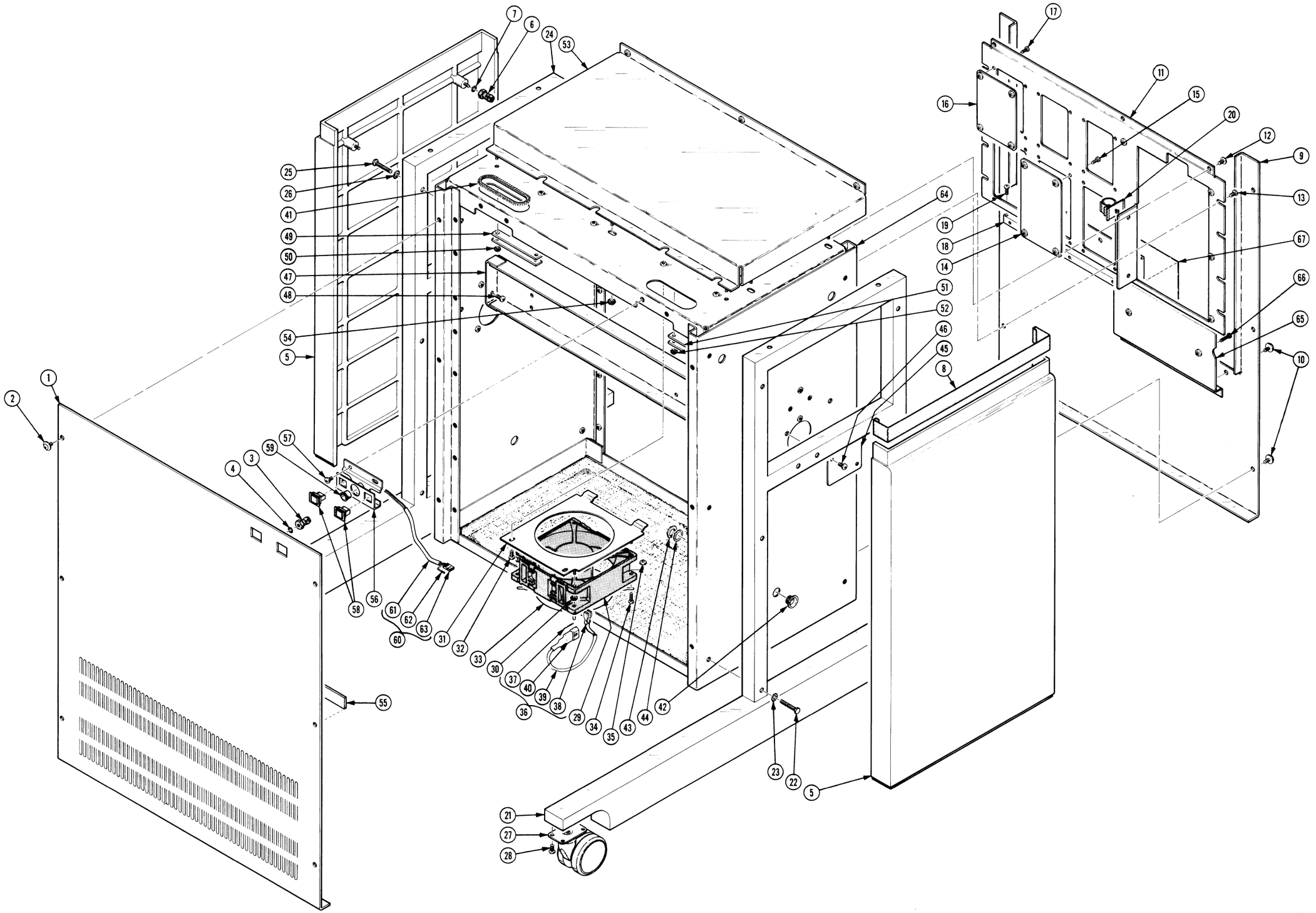


FIG. 3 PEDESTAL

FIG. 4 CARD CAGE

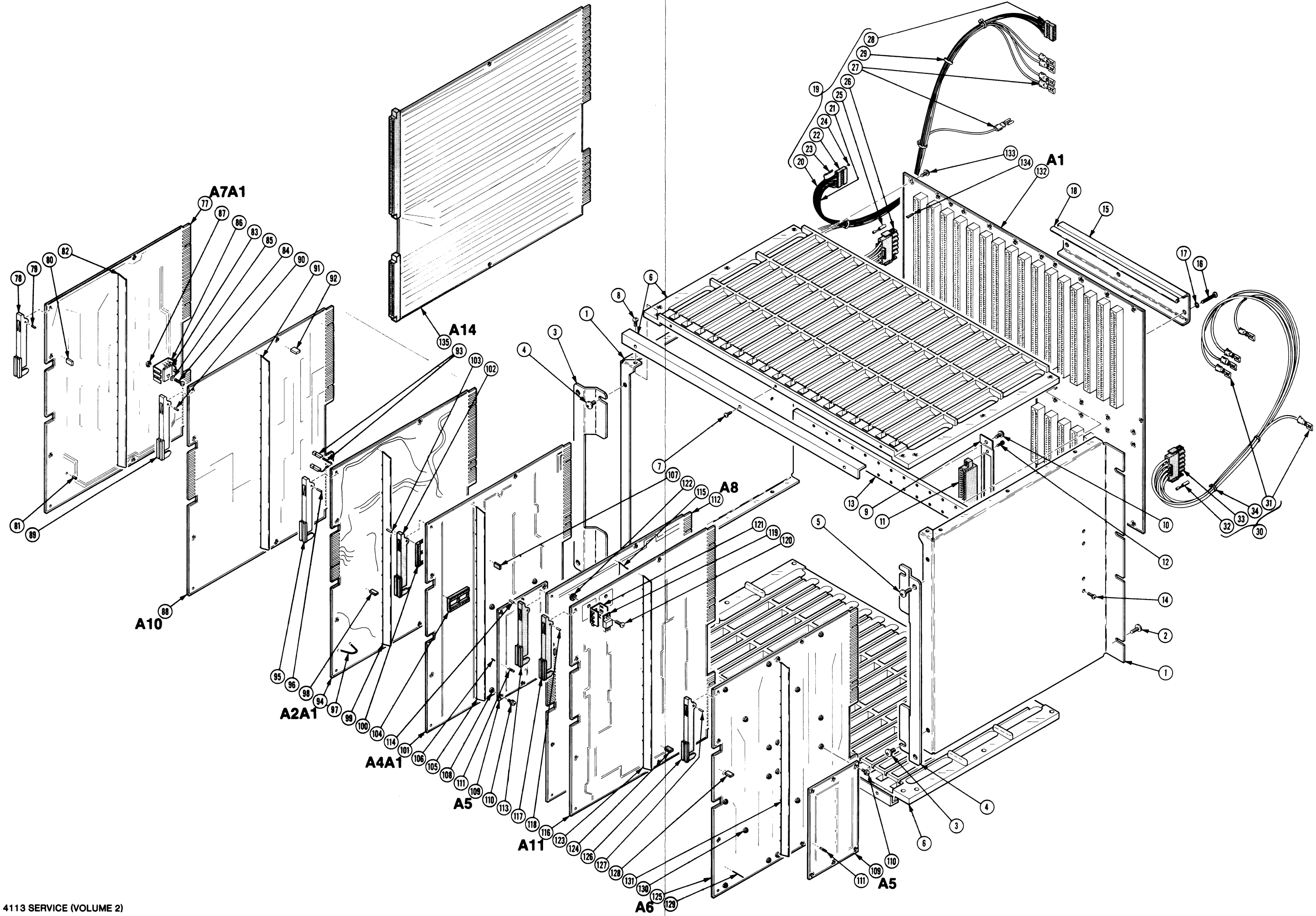


FIG. 4 CARD CAGE

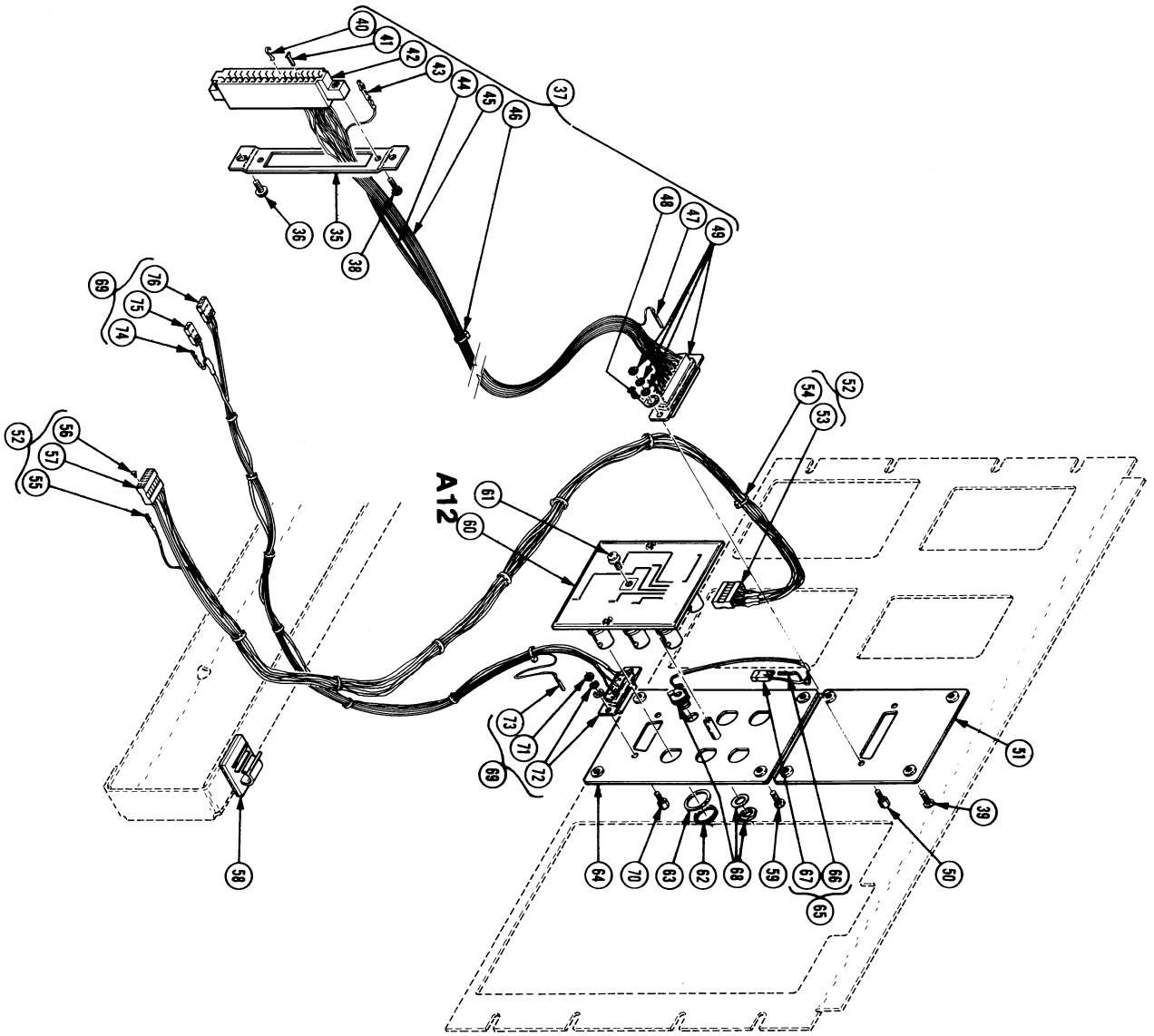


Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
4-1	407-2525-00			2		BRACKET,CMPNT:CKT BD CAGE,R& L	80009	407-2525-00
						(ATTACHING PARTS)		
-2	212-0518-00			8		SCREW,MACHINE:10-32 X 0.312 INCH,PNH STL	83385	OBD
-3	212-0507-00			4		SCREW,MACHINE:10-32 X 0.375 INCH,PNH STL	83385	OBD
						- - - * - - -		
-4	407-2537-00			2		BRKT,CKT BD CAG:ALUMINUM	80009	407-2537-00
						(ATTACHING PARTS)		
-5	212-0507-00			4		SCREW,MACHINE:10-32 X 0.375 INCH,PNH STL	83385	OBD
						- - - * - - -		
-6	386-4410-00			2		PNL,CKT BD CAGE:UPPER & LOWER	80009	386-4410-00
-7	213-0149-00			6		. SCR,TAP.,THD FO:6-32 X 0.375 INCH,PNH BRS	83385	OBD
						(ATTACHING PARTS FOR PANEL)		
-8	211-0507-00			16		SCREW,MACHINE:6-32 X 0.312 INCH,PNH STL	83385	OBD
						- - - * - - -		
-9	386-4384-00			2		PLATE,CONN MTG:ALUMINUM	80009	386-4384-00
						(ATTACHING PARTS)		
-10	211-0658-00			4		SCR,ASSEM WSHR:6-32 X 0.312 L,PNH,STL	78189	OBD
						- - - * - - -		
-11	204-0877-00			2		CONN BODY,RCPT:22/44 CONTACT	00779	583891-9
						(ATTACHING PARTS)		
-12	211-0033-00			4		SCR,ASSEM WSHR:4-40 X 0.312 PNH,STL,CD PL	83385	OBD
						- - - * - - -		
-13	386-4385-00			1		SUPPORT,CKT BD:ALUMINUM	80009	386-4385-00
						(ATTACHING PARTS)		
-14	212-0518-00			4		SCREW,MACHINE:10-32 X 0.312 INCH,PNH STL	83385	OBD
						- - - * - - -		
-15	386-4877-00			1		STIFFENER,CAGE:CIRCUIT BOARD,AL		
						(ATTACHING PARTS)		
-16	211-0514-00			4		SCREW,MACHINE:6-32 X 0.750 INCH,PNH STL	83385	OBD
-17	210-0005-00			4		WASHER,LOCK:#6 EXT,0.02 THK,STL	78189	1106-00
						- - - * - - -		
-18	255-0334-00			1		PLASTIC CHANNEL:12.75 X 0.175X 0.155,NYL	11897	122-37-2500
-19	179-2758-00			1		WIRING HARNESS:MOTHER BOARD	29598	OBD
-20	175-3552-00			AR		. CA ASSY,SP,ELEC:7,22 AWG,26.0L,RIBBON	80009	175-3552-00
-21	175-3553-00			AR		. CA ASSY,SP,ELEC:8,22 AWG,26.0L,RIBBON	80009	175-3553-00
-22	352-0484-01			1		. HLDR,TERM CONN:16 WIRE,DBL ROW,BLACK	22526	65043-124
-23	131-0621-00			15		. CONNECTOR,TERM:22-26 AWG,BRS& CU BE GOLD	22526	46231
-24	134-0153-00			1		. KEY,PLZN CONN:MINI LATCH HSG	80009	134-0153-00
-25	131-2386-00			5		. CONTACT,ELEC:CONN,FEMALE,PH	00779	640310-3
-26	204-0891-00			1		. CONN BODY,PLUG:5 MALE CONTACTS	00779	350809-1
-27	131-1565-00			5		. TERMINAL BOARD:ACCOM 5 TERM,POLYCARBONATE	80009	131-1565-00
-28	352-0484-00			1		. HLDR,TERM CONN:16 WIRE,DBL ROW,BLACK	22526	65043-124
-29	343-0549-00			5		. STRAP,TIEDOWN:0.091 W X 3.62 INCH LONG	59730	TY100
-30	198-4330-00			1		WIRE SET,ELEC:	80009	198-4330-00
-31	131-1563-00			5		. TERM,QIK DISC.:FEMALE ACCOM 0.25 X 0.037	00779	61198-1
-32	131-2386-00			5		. CONTACT,ELEC:CONN,FEMALE,PH	00779	640310-3
-33	204-0891-00			1		. CONN BODY,PLUG:5 MALE CONTACTS	00779	350809-1
-34	343-0549-00			2		. STRAP,TIEDOWN:0.091 W X 3.62 INCH LONG	59730	TY100
-35	386-4384-00			1		PLATE,CONN MTG:ALUMINUM	80009	386-4384-00
						(ATTACHING PARTS)		
-36	211-0658-00			2		SCR,ASSEM WSHR:6-32 X 0.312 L,PNH,STL	78189	OBD
						- - - * - - -		
-37	198-4423-00			1		WIRE SET,ELEC:	80009	198-4423-00
						(ATTACHING PARTS)		
-38	211-0033-00			2		SCR,ASSEM WSHR:4-40 X 0.312 PNH,STL,CD PL	83385	OBD
-39	211-0507-00			4		SCREW,MACHINE:6-32 X 0.312 INCH,PNH STL	83385	OBD
						- - - * - - -		
	----- -----			-		WIRE SET INCLUDES:		
-40	214-3082-00			4		. SPRING,RTNG:CU BE,GOLD FASH OVER NP	00779	583691-3
-41	214-3114-00			2		. KEY,CONN PLZN:CIRCUIT BD CONN	00779	530687-1
-42	204-0877-00			1		. CONN BODY,RCPT:22/44 CONTACT	00779	583891-9
-43	131-2161-01			14		. TERM,QIK DISC:24-28 AWG,PHOSPHOR	00779	583616-2
-44	175-0827-00			AR		. CABLE,SP,ELEC:4,26 AWG,STRD,PVC JKT,RBN	08261	SS04267(1061)0C
-45	175-0833-00			AR		. WIRE,ELECTRICAL:10 WIRE RIBBON	08261	SS-1026-7
-46	343-0549-00			1		. STRAP,TIEDOWN:0.091 W X 3.62 INCH LONG	59730	TY100

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
4-47	131-1279-00			14		. CONTACT,ELEC:MALE,28-24 AWG WIRE,0.040 DIA	00779	205310-4
	131-1450-00			1		. CONTACT,ELEC:MALE,24-30 AWG WIRE,0.040 DIA	00779	205202-6
-48	210-0202-00			1		. TERMINAL,LUG:0.146 ID,LOCKING,BRZ TINNED	78189	2104-06-00-2520N
-49	131-1316-00			1		. CONNECTOR BODY,:25 MALE-CONT POSITIONS	00779	208076-1
						(ATTACHING PARTS)		
-50	131-0890-00			2		. LOCK,CONNECTOR:4-40 X 0.312 L	71468	D 20418-2
						- - - * - - -		
-51	386-4610-00			1		. PLATE,CONN MTG:ALUMINUM	80009	386-4610-00
-52	198-4712-00			1		WIRE SET,ELEC:	80009	198-4712-00
-53	352-0537-00			1		. HLDR,TERM CONN:14 FEMALE,0.1 SPACING	59730	TY100
-54	343-0549-00			6		. STRAP,TIEDOWN:0.091 W X 3.62 INCH LONG	22526	47439
-55	131-0707-00			14		. CONNECTOR,TERM:22-26 AWG,BRS& CU BE GOLD	22526	47437
	131-0708-00			10		. CONTACT,ELEC:0.48"L,28-32 AWG WIRE	80009	134-0153-00
-56	134-0153-00			2		. KEY,PLZN CONN:MINI LATCH HSG		
-57	352-0537-00			1		. HLDT,TERM CONN:14 FEMALE,0.1 SPACING	34785	030-0625
-58	343-0915-00			1		CLAMP,LOOP:0.625 ID,NYLON	80009	021-0347-00
	021-0347-00			1		INTERFACE:DISPLAY INTERCONNECT		
						(ATTACHING PARTS)		
-59	211-0507-00			4		SCREW,MACHINE:6-32 X 0.312 INCH,PNH STL	83385	OBD
						- - - * - - -		
	-----	-----		-		DISPLAY INTERCONNECT ASSY INCLUDES:		
-60	-----	-----		-		. DISPLAY BOARD ASSY:(SEE A12 REPL)		
						(ATTACHING PARTS)		
-61	211-0658-00			1		. SCR,ASSEM WSHR:6-32 X 0.312 L,PNH,STL	78189	OBD
-62	220-0695-00			5		. NUT,PLAIN,DODEC:0.500-28 X 0.90 INCH,BRS	73743	OBD
-63	210-0845-00			5		. WASHER,FLAT:0.500 ID X 0.625 INCH OD,STL	89663	634-R
						- - - * - - -		
-64	386-4860-00			1		. PLATE,CONN MTG:DISPLAY ALUMINUM	80009	175-4471-00
-65	175-4471-00			1		. CA ASSY,SP,ELEC:2,22 AWG,6.0 L,RIBBON	22526	47439
-66	131-0707-00			1		. . CONNECTOR,TERM:22-26 AWG,BRS& CU BE GOLD	80009	352-0169-00
-67	352-0169-00			1		. . HLDR,TERM CONN:2 WIRE BLACK	80009	136-0094-00
-68	136-0094-00			1		. JACK,TELEPHONE:MINIATURE,SHUNT TYPE	80009	198-4710-00
-69	198-4710-00			1		. WIRE SET,ELEC:		
						(ATTACHING PARTS)		
-70	129-0260-00			2		. POST,ELEC-MECH:0.255 HEX X 0.500 INCH L	80009	129-0260-00
-71	210-0586-00			2		. NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL	83385	OBD
						- - - * - - -		
	352-0482-00			1		. HOLDER,CA,TIE:0.75 SQ,STICKY BACK,PLASTIC	06383	ABMM-A
	343-0549-00			1		. STRAP,TIEDOWN:0.091 W X 3.62 INCH LONG	59730	TY100
	-----	-----		-		. WIRE SET INCLUDES:		
-72	131-0458-00			1		. . CONNECTOR,RCPT,:15 PIN,FEMALE	71468	DA15S
-73	-----	-----		-		. . CONTACT PART OF CONNECTOR		
-74	131-0707-00			4		. . CONNECTOR,TERM:22-26 AWG,BRS& CU BE GOLD	22526	47439
	131-0708-00			1		. . CONTACT,ELEC:0.48"L,28-32 AWG WIRE	22526	47437
-75	352-0169-00			1		. . HLDR,TERM CONN:2 WIRE BLACK	80009	352-0169-00
-76	352-0161-00			1		. . HLDR,TERM CONN:3 WIRE,BLACK	80009	352-0161-00
-77	-----	-----		1		CKT BOARD ASSY:VIDEO CONT(SEE A7A1 REPL)		
-78	105-0851-00			2		. EJECTOR,CKT BD:GRAY PLASTIC	80009	105-0851-00
						(ATTACHING PARTS)		
-79	214-1337-00			2		. PIN,SPRING:0.10 OD X 0.25 INCH L,STL	80009	214-1337-00
						- - - * - - -		
-80	131-0993-00			8		. BUS,CONDUCTOR:2 WIRE BLACK	00779	530153-2
-81	136-0388-00			2		. SOCKET,PIN TERM:U/W 0.04 DIA PIN	71279	450-3704-01-0300
-82	124-0388-00			1		. BUS,CONDUCTOR:CIRCUIT BOARD,16 TAB	80009	124-0388-00
-83	-----	-----		1		. TRANSISTOR:(SEE A7A1Q621 REPL)		
						(ATTACHING PARTS)		
-84	211-0198-00			1		. SCREW,MACHINE:4-40 X 0.438 PNH,STL,POZ	77250	OBD
-85	210-1122-00			1		. WASHER,LOCK:0.12 ID,DISHED,0.025 THK	86928	OBD
-86	214-1967-00			1		. HEAT SINK,DIODE:FINGER TYPE	13103	6107B-14
-87	210-0586-00			1		. NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL	83385	OBD
-88	-----	-----		1		CKT BOARD ASSY:DUAL RASTER MEM(SEE A10 REPL)		
-89	105-0851-00			2		. EJECTOR,CKT BD:GRAY PLASTIC	80009	105-0851-00
						(ATTACHING PARTS)		
-90	214-1337-00			2		. PIN,SPRING:0.10 OD X 0.25 INCH L,STL	80009	214-1337-00
						- - - * - - -		

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5 Name & Description	Mfr Code	Mfr Part Number
4-91	124-0388-00			2	. BUS,CONDUCTOR:CIRCUIT BOARD,16 TAB	80009	124-0388-00
-92	131-0993-00			2	. BUS,CONDUCTOR:2 WIRE BLACK	00779	530153-2
-93	131-1270-00			4	. BUS,CONDUCTOR:	80009	131-1270-00
-94	----- -----			1	CKT BOARD ASSY:PROCESSOR(SEE A2A1 REPL)		
-95	105-0851-00			2	. EJECTOR,CKT BD:GRAY PLASTIC	80009	105-0851-00
					(ATTACHING PARTS)		
-96	214-1337-00			2	. PIN,SPRING:0.10 OD X 0.25 INCH L,STL	80009	214-1337-00
					- - - * - - -		
-97	346-0032-00			1	. STRAP,RETAINING:0.075 DIA X 4.0 L,MLD RBR	98159	2859-75-4
-98	131-0993-00			1	. BUS,CONDUCTOR:2 WIRE BLACK	00779	530153-2
-99	124-0388-00			1	. BUS,CONDUCTOR:CIRCUIT BOARD,16 TAB	80009	124-0388-00
-100	136-0751-00			8	. SKT,PL-IN ELEK:MICROCKT,24 PIN	09922	DILB24P108
-101	----- -----			1	CKT BOARD ASSY:RAM ROM(SEE A4A1 REPL)		
-102	105-0851-00			2	. EJECTOR,CKT BD:GRAY PLASTIC	80009	105-0851-00
					(ATTACHING PARTS)		
-103	214-1337-00			2	. PIN,SPRING:0.10 OD X 0.25 INCH L,STL	80009	214-1337-00
					- - - * - - -		
-104	136-0751-00			24	. SKT,PL-IN ELEK:MICROCKT,24 PIN	09922	DILB24P108
-105	124-0388-00			2	. BUS,CONDUCTOR:CIRCUIT BOARD,16 TAB	80009	124-0388-00
-106	131-0787-00			54	. CONTACT,ELEC:0.64 INCH LONG	22526	47359
-107	131-0993-00			26	. BUS,CONDUCTOR:2 WIRE BLACK	00779	530153-2
-108	129-0317-00			5	. POST,ELEC-MECH:4-40 X 0.187 X 0.125 INCH L	80009	129-0317-00
-109	----- -----			1	CKT BOARD ASSY:RAM ARRAY(SEE A5 REPL)		
					(ATTACHING PARTS)		
-110	211-0244-00			4	SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH STL	78189	OBD
					- - - * - - -		
	----- -----			-	RAM ARRAY BOARD INCLUDES:		
-111	136-0263-04			54	. SOCKET,PIN TERM:FOR 0.025 INCH SQUARE PIN	22526	75377-001
-112	----- -----			1	CKT BOARD ASSY:VECTOR GEN(SEE A8 REPL)		
-113	105-0851-00			2	. EJECTOR,CKT BD:GRAY PLASTIC	80009	105-0851-00
					(ATTACHING PARTS)		
-114	214-1337-00			2	. PIN,SPRING:0.10 OD X 0.25 INCH L,STL	80009	214-1337-00
					- - - * - - -		
-115	124-0388-00			4	. BUS,CONDUCTOR:CIRCUIT BOARD,16 TAB	80009	124-0388-00
-116	----- -----			1	CKT BOARD ASSY:DUAL RASTER MEM(SEE A11 REPL)		
-117	105-0851-00			2	. EJECTOR,CKT BD:GRAY PLASTIC	80009	105-0851-00
					(ATTACHING PARTS)		
-118	214-1337-00			2	. PIN,SPRING:0.10 OD X 0.25 INCH L,STL	80009	214-1337-00
					- - - * - - -		
-119	----- -----			2	. MICROCIRCUIT:(SEE A11U65,A11U165 REPL)		
					(ATTACHING PARTS)		
-120	211-0507-00			2	. SCREW,MACHINE:6-32 X 0.312 INCH,PNH STL	83385	OBD
-121	214-3036-00			2	. HEATSINK,XSTR:TO-220,ALUMINUM	80009	214-3036-00
-122	210-0457-00			2	. NUT,PL,ASSEM WA:6-32 X 0.312 INCH,STL	83385	OBD
					- - - * - - -		
-123	124-0388-00			1	. BUS,CONDUCTOR:CIRCUIT BOARD,16 TAB	80009	124-0388-00
-124	131-0993-00			1	. BUS,CONDUCTOR:2 WIRE BLACK	00779	530153-2
-125	----- -----			1	CKT BOARD ASSY:RAM CONT(SEE A6 REPL)		
-126	105-0851-00			2	. EJECTOR,CKT BD:GRAY PLASTIC	80009	105-0851-00
					(ATTACHING PARTS)		
-127	214-1337-00			2	. PIN,SPRING:0.10 OD X 0.25 INCH L,STL	80009	214-1337-00
					- - - * - - -		
-128	131-0993-00			1	. BUS,CONDUCTOR:2 WIRE BLACK	00779	530153-2
-129	131-0787-00			216	. CONTACT,ELEC:0.64 INCH LONG	22526	47359
-130	129-0317-00			20	. POST,ELEC-MECH:4-40 X 0.187 X 0.125 INCH L	80009	129-0317-00
-131	124-0388-00			1	. BUS,CONDUCTOR:CIRCUIT BOARD,16 TAB	80009	124-0388-00
-132	----- -----			1	CKT BOARD ASSY:MOTHER(SEE A1 REPL)		
					(ATTACHING PARTS)		
-133	211-0658-00			26	SCR,ASSEM WSHR:6-32 X 0.312 L,PNH,STL	78189	OBD
					- - - * - - -		
	----- -----			-	MOTHER BOARD INCLUDES:		
-134	214-3114-00			39	. KEY,CONN PLZN:CIRCUIT BD CONN	00779	530687-1
-135	----- -----			1	LOGIC EXTENDER BOARD:(SEE A14 REPL)		

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
5-	----- -----			1		POWER SUPPLY ASSY:(SEE A13 REPL)		
						(ATTACHING PARTS)		
-1	212-0518-00			2		SCREW,MACHINE:10-32 X 0.312 INCH,PNH STL	83385	OBD
-2	211-0511-00			2		SCREW,MACHINE:6-32 X 0.500,PNH,STL,CD PL	83385	OBD
-3	211-0513-00			6		SCREW,MACHINE:6-32 X 0.625 INCH,PNH STL	83385	OBD
						- - - * - - -		
	----- -----			-		POWER SUPPLY ASSY INCLUDES:		
-4	386-4363-00			1		. SPRT,POWER SPLY:FRONT,AL	80009	386-4363-00
						(ATTACHING PARTS)		
-5	211-0507-00			6		. SCREW,MACHINE:6-32 X 0.312 INCH,PNH STL	83385	OBD
-6	211-0504-00			6		. SCREW,MACHINE:6-32 X 0.25 INCH,PNH STL	83385	OBD
						- - - * - - -		
-7	200-2481-00			1		. COVER,PWR SPLY:LEFT,AL	80009	200-2481-00
						(ATTACHING PARTS)		
-8	211-0511-00			3		. SCREW,MACHINE:6-32 X 0.500,PNH,STL,CD PL	83385	OBD
						- - - * - - -		
-9	214-2853-00			1		. BOLT,U:6-32 X 3.4 X 2.69,BRASS	02114	70 U BOLT
-10	210-0457-00			2		. NUT,PL,ASSEM WA:6-32 X 0.312 INCH,STL	83385	OBD
-11	----- -----			1		. CKT BOARD ASSY:REGULATOR(SEE A13A2 REPL)		
						(ATTACHING PARTS)		
-12	211-0244-00			8		. SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH STL	78189	OBD
						- - - * - - -		
	----- -----			-		. REGULATOR ASSY INCLUDES:		
-13	----- -----			1		. . TRANSFORMER:(SEE A13A2T190 REPL)		
-14	----- -----			1		. . COIL:(SEE A13A2L291 REPL)		
						(ATTACHING PARTS)		
-15	211-0003-00			1		. . SCREW,MACHINE:2-56 X 0.875 INCH,PNH,STL	83385	OBD
-16	210-1017-00			1		. . WASHER,NONMETAL:0.281 ID X 0.875 INCH ID	80009	210-1017-00
-17	210-0053-00			1		. . WASHER,LOCK:INTL,0.092 ID X 0.175"OD,STL	83385	OBD
-18	210-0405-00			1		. . NUT,PLAIN,HEX.:2-56 X 0.188 INCH,BRS	73743	12157-50
						- - - * - - -		
-19	----- -----			1		. . COIL:(SEE A13A2L361 REPL)		
						(ATTACHING PARTS)		
-20	343-0769-00			1		. . CLAMP,POT CORE:	000IJ	FP 36/ZZ-66
						- - - * - - -		
-21	----- -----			1		. TRANSISTOR:(SEE A13Q795 REPL)		
						(ATTACHING PARTS)		
-22	211-0012-00			1		. SCREW,MACHINE:4-40 X 0.375,PNH STL CD PL	83385	OBD
-23	210-1291-00			1		. WASHER,SHLDR:0.118 ID X 0.1 THK,PLSTC	80009	210-1291-00
-24	342-0328-00			1		. INSULATOR,PLATE:XSTR,ALUMINUM	80009	342-0328-00
						- - - * - - -		
-25	----- -----			1		. TRANSISTOR:(SEE A13Q761 REPL)		
						(ATTACHING PARTS)		
-26	211-0012-00			1		. SCREW,MACHINE:4-40 X 0.375,PNH STL CD PL	83385	OBD
-27	210-1291-00			1		. WASHER,SHLDR:0.118 ID X 0.1 THK,PLSTC	80009	210-1291-00
-28	342-0328-00			1		. INSULATOR,PLATE:XSTR,ALUMINUM	80009	342-0328-00
						- - - * - - -		
-29	----- -----			2		. TRANSISTOR:(SEE A13Q751,A13Q785 REPL)		
						(ATTACHING PARTS)		
-30	211-0012-00			2		. SCREW,MACHINE:4-40 X 0.375,PNH STL CD PL	83385	OBD
-31	210-1291-00			2		. WASHER,SHLDR:0.118 ID X 0.1 THK,PLSTC	80009	210-1291-00
-32	342-0328-00			2		. INSULATOR,PLATE:XSTR,ALUMINUM	80009	342-0328-00
						- - - * - - -		
-33	----- -----			2		. TRANSISTOR:(SEE A13Q741,A13Q771 REPL)		
						(ATTACHING PARTS)		
-34	211-0012-00			2		. SCREW,MACHINE:4-40 X 0.375,PNH STL CD PL	83385	OBD
-35	210-1291-00			2		. WASHER,SHLDR:0.118 ID X 0.1 THK,PLSTC	80009	210-1291-00
-36	342-0328-00			2		. INSULATOR,PLATE:XSTR,ALUMINUM	80009	342-0328-00
						- - - * - - -		
-37	407-2511-00			1		. BRACKET,SUPPORT:POWER SUPPLY,REGULATOR	80009	407-2511-00
						(ATTACHING PARTS)		
-38	211-0511-00			4		. SCREW,MACHINE:6-32 X 0.500,PNH,STL,CD PL	83385	OBD
						- - - * - - -		
-39	333-2751-02			1		. PANEL,REAR:	80009	333-2751-02

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
5-40	----- -----			1		. CONN RCPT:PWR FEMALE(SEE A13J3002 REPL)		
						(ATTACHING PARTS)		
-41	211-0012-00			2		. SCREW,MACHINE:4-40 X 0.375,PNH STL CD PL	83385	OBD
						- - - * - - -		
-42	----- -----			1		. CONN RCPT:PWR MALE(SEE A13J3001 REPL)		
						(ATTACHING PARTS)		
-43	211-0012-00			2		. SCREW,MACHINE:4-40 X 0.375,PNH STL CD PL	83385	OBD
						- - - * - - -		
-44	195-0954-00			2		. LEAD,ELECTRICAL:18 AWG,5.0 L,5-4	80009	195-0954-00
-45	210-0202-00			2		. . TERMINAL,LUG:0.146 ID,LOCKING,BRZ TINNED	78189	2104-06-00-2520N
-46	210-0457-00			3		. NUT,PL,ASSEM WA:6-32 X 0.312 INCH,STL	83385	OBD
-47	210-0202-00			1		. TERMINAL,LUG:0.146 ID,LOCKING,BRZ TINNED	78189	2104-06-00-2520N
-48	334-3379-02			3		. MARKER,IDENT:MARKED GROUNDSYMBOL	80009	334-3379-02
-49	204-0832-00			1		. BODY,FUSEHOLDER:3AG,5 X 20MM FUSES	S3629	031.1673(MDLFEU)
-50	210-1039-00			1		. WASHER,LOCK:INT,0.521 ID X 0.625 INCH OD	24931	OBD
-51	200-2264-00			1		. CAP.,FUSEHOLDER:3AG FUSES	S3629	FEK 031 1666
-52	----- -----			1		. COIL POT CORE:(SEE A13L1001 REPL)		
						(ATTACHING PARTS)		
-53	211-0530-00			1		. SCREW,MACHINE:6-32 X 1.75 INCH,PNH STL	83385	OBD
-54	343-0871-00			1		. CLAMP,MOUNTING:POT COIL,AL	80009	343-0871-00
						- - - * - - -		
-55	----- -----			1		. LINE FILTER:(SEE A13FL1001 REPL)		
						(ATTACHING PARTS)		
-56	210-0586-00			2		. NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL	83385	OBD
						- - - * - - -		
-57	366-1522-00			1		. KNOB:LINE VOLTAGE INDICATOR	80009	366-1522-00
						(ATTACHING PARTS)		
-58	211-0507-00			1		. SCREW,MACHINE:6-32 X 0.312 INCH,PNH STL	83385	OBD
						- - - * - - -		
-59	200-2501-00			1		. COVER,DIODE:ALUMINUM	80009	200-2501-00
						(ATTACHING PARTS)		
-60	211-0513-00			2		. SCREW,MACHINE:6-32 X 0.625 INCH,PNH STL	83385	OBD
						- - - * - - -		
-61	----- -----			2		. SEMICOND DEVICE:(SEE A13CR1001,A13CR1004 REPL)		
						(ATTACHING PARTS)		
-62	210-0224-00			2		. TERMINAL,LUG:0.20 ID X 0.344 OD,SE,BRS	86928	A373-148-1
-63	210-0909-00			4		. WASHER,NONMETAL:0.196 ID X 0.625" OD,MICA	83309	OBD
-64	210-0910-00			2		. WASHER,NONMETAL:0.188 ID X 0.313" OD,TEFLON	02107	OBD
-65	210-1266-00			2		. WASHER,FLAT:0.193 ID X 0.475 OD X 0.0075"	86928	5702-79-75
-66	210-0410-00			2		. NUT,PLAIN,HEX.:10-32 X 0.312 INCH,BRS	73743	2X20003-402
						- - - * - - -		
-67	----- -----			2		. SEMICOND DEVICE:(SEE A13CR1002,A13CR1003 REPL)		
						(ATTACHING PARTS)		
-68	210-0333-00			2		. TERMINAL LUG:0.255 ID,BRASS,TIN PLATED	86928	5411-38
-69	210-1286-00			4		. WASHER,FLAT:0.25 ID X 0.002 THK,MICA	86928	5624-72-2
-70	210-1115-00			2		. WASHER,FLAT:0.27 ID X 0.062 THK,0.37 OD	86445	OBD
-71	210-0853-00			2		. WASHER,FLAT:0.25 ID X 0.50 OD	86044	OBD
-72	210-0455-00			2		. NUT,PLAIN,HEX.:0.25-28 X 0.375 INCH,BRASS	73743	3089-402
						- - - * - - -		
-73	210-0285-00			2		. TERMINAL,LUG:	00779	321051
						(ATTACHING PARTS)		
-74	211-0507-00			2		. SCREW,MACHINE:6-32 X 0.312 INCH,PNH STL	83385	OBD
-75	210-0457-00			2		. NUT,PL,ASSEM WA:6-32 X 0.312 INCH,STL	83385	OBD
						- - - * - - -		
-76	407-2510-00			1		. BRACKET,SUPPORT:POWER SUPPLY,INVERTER,AL	80009	407-2510-00
						(ATTACHING PARTS)		
-77	211-0511-00			3		. SCREW,MACHINE:6-32 X 0.500,PNH,STL,CD PL	83385	OBD
						- - - * - - -		
-78	----- -----			1		. CKT BOARD ASSY:INVERTER(SEE A17A1 REPL)		
						(ATTACHING PARTS)		
-79	211-0244-00			9		. SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH STL	78189	OBD
						- - - * - - -		

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
5-	----- -----			-		. INVERTER BOARD INCLUDES:		
-80	----- -----			-		. . TRANSISTOR:(SEE A13A1Q205 REPL)		
						(ATTACHING PARTS)		
-81	211-0014-00			1		. . SCREW,MACHINE:4-40 X 0.50 INCH,PNH STL	83385	OBD
-82	214-2957-00			1		. . HEAT SINK,XSTR:TO-220,AL	80009	214-2957-00
-83	166-0093-00			1		. . SPACER,SLEEVE:0.196 ID X 0.188" LONG,AL	80009	166-0093-00
-84	210-0586-00			1		. . NUT,PL,ASSEM WA:4-40 X 0.25,STL CD PL	83385	OBD
						- - - * - - -		
-85	334-2359-00			1		. . MARKER,IDENT:WARNING	80009	334-2359-00
-86	131-0993-00			1		. . BUS,CONDUCTOR:2 WIRE BLACK	00779	530153-2
-87	198-4571-00			1		. . WIRE SET,ELEC:	80009	198-4571-00
	131-0621-00			6		. . . CONNECTOR,TERM:22-26 AWG,BRS& CU BE GOLD	22526	46231
-88	352-0206-00			1		. . . HLDR,TERM CONN:10 WIRE BLACK	80009	352-0206-00
	----- -----			-		. . . (A13A1P62)		
-89	343-0937-00			1		. . RETAINER,CAP:POLYURETHANE	80009	343-0937-00
-90	343-0937-01			1		. . RETAINER,CAP:POLYURETHANE	80009	343-0937-01
-91	200-2269-00			1		. COVER,XSTR:	80009	200-2269-00
						(ATTACHING PARTS)		
-92	211-0513-00			2		. SCREW,MACHINE:6-32 X 0.625 INCH,PNH STL	83385	OBD
						- - - * - - -		
-93	342-0449-01			1		. INSULATOR,PLATE:TRANSISTOR,ALUMINA,PRINTED	80009	342-0449-01
-94	342-0458-00			1		. INSULATOR,PLATE:TRANSISTOR,MICA	08530	OBD
-95	195-1528-00			1		. LEAD,ELECTRICAL:26 AWG,2.5 L,9-N	80009	195-1528-00
	----- -----			-		. (A13Q710,A13Q720)		
-96	131-0707-00			1		. . CONNECTOR,TERM:22-26 AWG,BRS& CU BE GOLD	22526	47439
-97	352-0171-00			1		. . HLDR,TERM CONN:1 WIRE BLACK	80009	352-0171-00
	----- -----			-		. . (A13A1P66)		
-98	343-0549-00			1		. STRAP,TIEDOWN:0.091 W X 3.62 INCH LONG	59730	TY100
-99	200-2480-00			1		. COVER,PWR SPLY:RIGHT,AL	80009	200-2480-00
						(ATTACHING PARTS)		
-100	211-0511-00			3		. SCREW,MACHINE:6-32 X 0.500,PNH,STL,CD PL	83385	OBD
						- - - * - - -		
-101	214-3037-01			1		. HEAT SINK,ELEC:POWER SUPPLY	80009	214-3037-01
-102	175-5132-00			1		. CA ASSY,SP,ELEC:10,26 AWG,6.5L,RIBBON	80009	175-5132-00
-103	175-0833-00			AR		. . WIRE,ELECTRICAL:10 WIRE RIBBON	08261	SS-1026-7
-104	131-0707-00			20		. . CONNECTOR,TERM:22-26 AWG,BRS& CU BE GOLD	22526	47439
-105	352-0168-00			2		. . CONN BODY,PL,EL:10 WIRE BLACK	80009	352-0168-00
	----- -----			-		. . (A13A2P82,A13A1J66)		
-106	198-4331-00			1		. WIRE SET,ELEC:	80009	198-4331-00
-107	131-0947-00			1		. . CONN BODY,RCPT:MALE,SNAP-IN PNL MT,4 CONT	27264	03-09-1041
-108	175-3593-00			1		. . CA ASSY,SP,ELEC:3,18 AWG,10.0 L,8-4	80009	175-3593-00
-109	131-0792-00			3		. . . CONNECTOR,TERM:18-20 AWG,CU BE GOLD PL	22526	46221
-110	131-0948-00			3		. . . CONTACT,ELEC:CONNECTOR,BRASS TIN PL	27264	02-09-1103
-111	175-3594-00			2		. . CA ASSY,SP,ELEC:2,18 AWG,10.0 L,8-N		
-112	131-0792-00			2		. . . CONNECTOR,TERM:18-20 AWG,CU BE GOLD PL	22526	46221
-113	131-0948-00			3		. . . CONTACT,ELEC:CONNECTOR,BRASS TIN PL	27264	02-09-1103
-114	204-0826-00			2		. . CONN BODY,RCPT:2 CONT,FEMALE	27264	03-09-1021
-115	352-0205-03			1		. . CONN BODY,PL,EL:9 WIRE ORANGE	80009	352-0205-03
	----- -----			-		. . (FAN,FLEX-DISC-AC,FAN TO A13A1J63)		

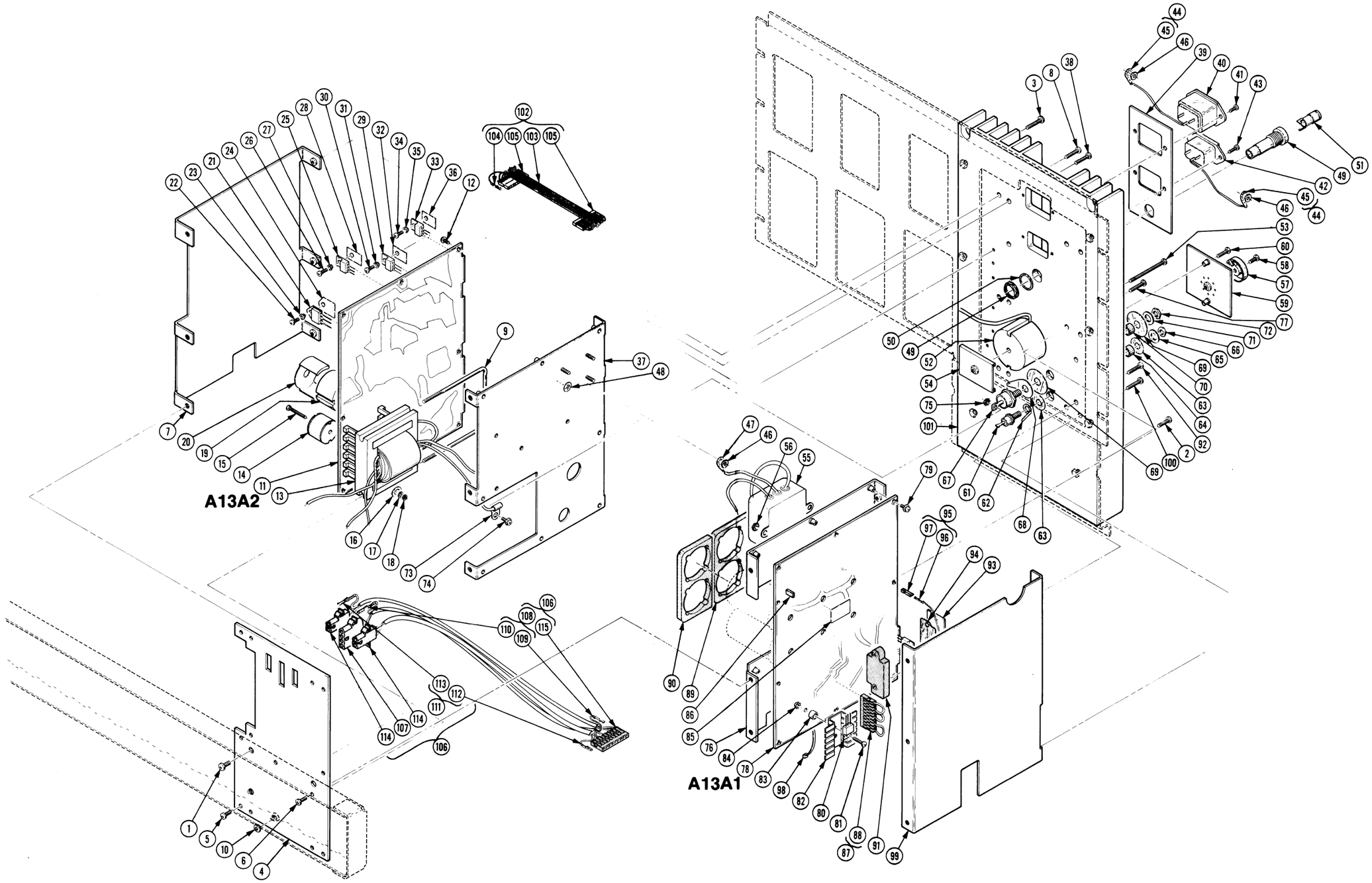


FIG. 5 POWER SUPPLY

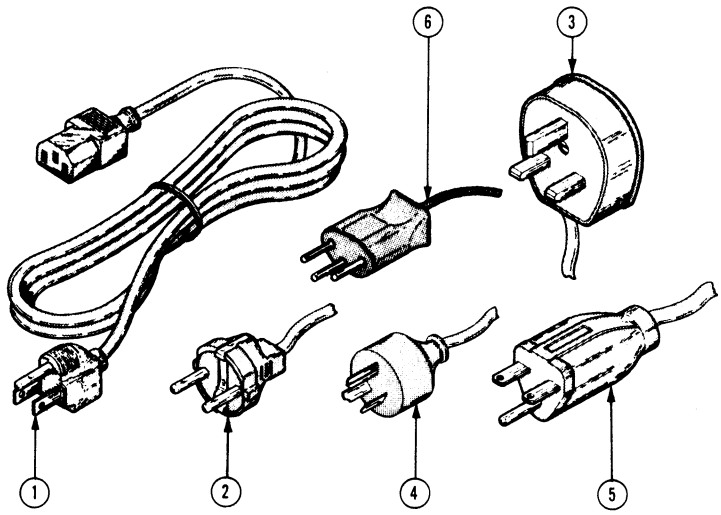


Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
						STANDARD ACCESSORIES		
6-1	161-0123-00			1		CABLE ASSY,PWR:3,16 AWG,125V,96.01	70903	KH9028
-2	161-0123-01			1		CABLE ASSY,PWR:3,0.75MM SQ,220V,96.0 L	80126	OBD
	----- -----			-		(OPTION A1 ONLY)		
-3	161-0123-02			1		CABLE ASSY,PWR:3,16 AWG,240V,96.0 L	80126	OBD
	----- -----			-		(OPTION A2 ONLY)		
-4	161-0123-03			1		CABLE ASSY,PWR:3,1MM SQ,240V,96.0 L	S3109	1600
	----- -----			-		(OPTION A3 ONLY)		
-5	161-0123-04			1		CABLE ASSY,PWR:3,1.0MM SQ,240V,96.0 L	80126	OBD
	----- -----			-		(OPTION A4 ONLY)		
-6	161-0154-00			1		CABLE ASSY,PWR:3,0.75MM SQ,240V,6A,2.5M L	000JA	OBD
	----- -----			-		(OPTION A5 ONLY)		
	161-0125-00			1		CABLE ASSY,PWR:3,18 AWG,125V,1 METER	16428	17524
	012-0074-00			3		CABLE ASSY,RF:75 OHM COAX,42.0 L	80009	012-0074-00
	012-0911-00			1		CABLE,INTCON:144.0 L	04919	OBD
	175-6385-00			1		CA ASSY,SP,ELEC:2,24 AWG,42.0 L,0-N		
	334-3290-01			6		OVERLAY,KYBD:BLANK	80009	334-3290-01
	366-1882-00			8		PUSH BUTTON:EARTH BRN,1 X1 RELEGENDABLE	80009	366-1882-00
	118-1768-00			2		KEY,LOCK:4113		
	070-4221-00			1		MANUAL,TECH:OPERATOR,4113	80009	070-4221-00
	070-4222-00			1		MANUAL,TECH:OPERATOR,4113	80009	070-4222-00
	061-2616-00			1		MANUAL,TECH:PROGRAMMER,4113	80009	061-2616-00
	061-2566-02			1		MANUAL,TECH:REFERENCE,4110 SERIES	80009	061-2566-02
						OPTIONAL ACCESSORIES		
	067-1005-00			1		FIXTURE,CAL:EXTENDER BOARD	80009	067-1005-00
	067-1043-00			1		FIXTURE,CAL:HOST PORT LOOP BACK CONN	80009	067-1043-00
	067-1107-00			1		FIXTURE,CAL:GRATICULE	80009	067-1107-00
	061-2617-00			1		MANUAL,TECH:SERVICE VOL 1,4113	80009	061-2617-00
	061-2618-00			1		MANUAL,TECH:SERVICE VOL 2,4113	80009	061-2618-00
	070-4275-00			1		MANUAL,TECH:SERVICE 640-0532-00	80009	070-4275-00

OPT	ORDER NO.	QTY	DESCRIPTION
A1	------		220V,EUROPEAN
A2	------		240V,UNITED KINGDOM
A3	------		240V,AUSTRALIAN
A4	------		240V,NORTH AMERICAN
A5	------		240V,SWISS
01	020-0606-00		EXTENDED COMMUNICATION
02	021-0323-00		CURRENT LOOP INTERFACE
4A	020-0596-00		UK KEYBOARD
4C	020-0598-00		SWEDISH KEYBOARD
4E	020-0604-00		APL KEYBOARD
4F	020-0602-00		DANISH/NORWEGIAN KEYBOARD
10	021-0313-00		INTERFACE:3 PORT PERIPHERAL
13	4110F13		GRAPHIC TABLET,11 X 11 W/PEN
14	4110F14		GRAPHIC TABLET,30 X 40 W/PEN
21	670-6476-01		ADD 1 PLANE:DISPLAY MEMORY
24	018-0159-00		ADDED MEMORY:32K RAM
	018-0160-00		ADDED MEMORY:32K RAM
25	018-0159-00	1	ADDED MEMORY:64K RAM
	018-0160-00	2	ADDED MEMORY:64K RAM
26	018-0159-00	1	ADDED MEMORY:96K RAM
	018-0160-00	3	ADDED MEMORY:96K RAM
27	018-0159-00	1	ADDED MEMORY:128K RAM
	018-0160-00	4	ADDED MEMORY:128K RAM
28	018-0159-00	2	ADDED MEMORY:256K RAM
	018-0160-00	8	ADDED MEMORY:256K RAM
29	018-0159-00	4	ADDED MEMORY:512K RAM
	018-0160-00	16	ADDED MEMORY:512K RAM
30	062-6410-00	1	LOCAL EASY GRAPHING
42	4110F42		FLEXIBLE DISK:SINGLE W/CONTROLLER
43	4110F43		FLEXIBLE DISK:DUAL W/CONTROLLER

Appendix A

INSTALLATION

INTRODUCTION

Installation consists of finding a suitable installation site, unpacking the terminal, checking operating voltages, applying power, testing the internal operation with Self Test, connecting the terminal to a host computer, and testing comunication between the host computer and the terminal.

WARNING

Dangerous voltages exist within the terminal. Use normal electrical precautions when working inside the terminal.

NOTE

The following installation procedure applies to the 4113 pedestal model, only. For information on how to install the 4113-30 desk configuration model, consult the 4110 Series Desk Configuration Service Manual.

The terminal is packaged as two units: the pedestal and the display module. Once these are unpacked, the display module is placed on top of the pedestal. The interconnecting cables between the pedestal and display are then connected (there are five cables). After this is done, the terminal is plugged into ac power and the host port communication cable is connected. No further assembly is required. However, if new options are to be installed, disassembly of the terminal may be required. THIS SHOULD BE DONE BY QUALIFIED SERVICE TECHNICIANS ONLY.

A step-by-step procedure for installing the terminal is included in the rest of this appendix.

SELECTING AN INSTALLATION SITE

The primary requirement for proper operation is adequate ventilation clearance around the terminal. Make sure that the heat sink at the back of the terminal has at least two inches (5.08 cm) clearance from the nearest wall or surface. More clearance provides better ventilation and greater reliability.

Temperature should be within the range of +10 to +40 C (50 to 104 F) without the flexible disk drive(s) option (Option 42/43) and +10 to +38 C (50 to 100 F) with the option. Relative humidity should be a maximum of 75% without Option 42/43 and within the range of 20% to 75% with Option 42/43.

Use Figure A-1, 4113 Dimensions, to determine amount of space to allow for the terminal.

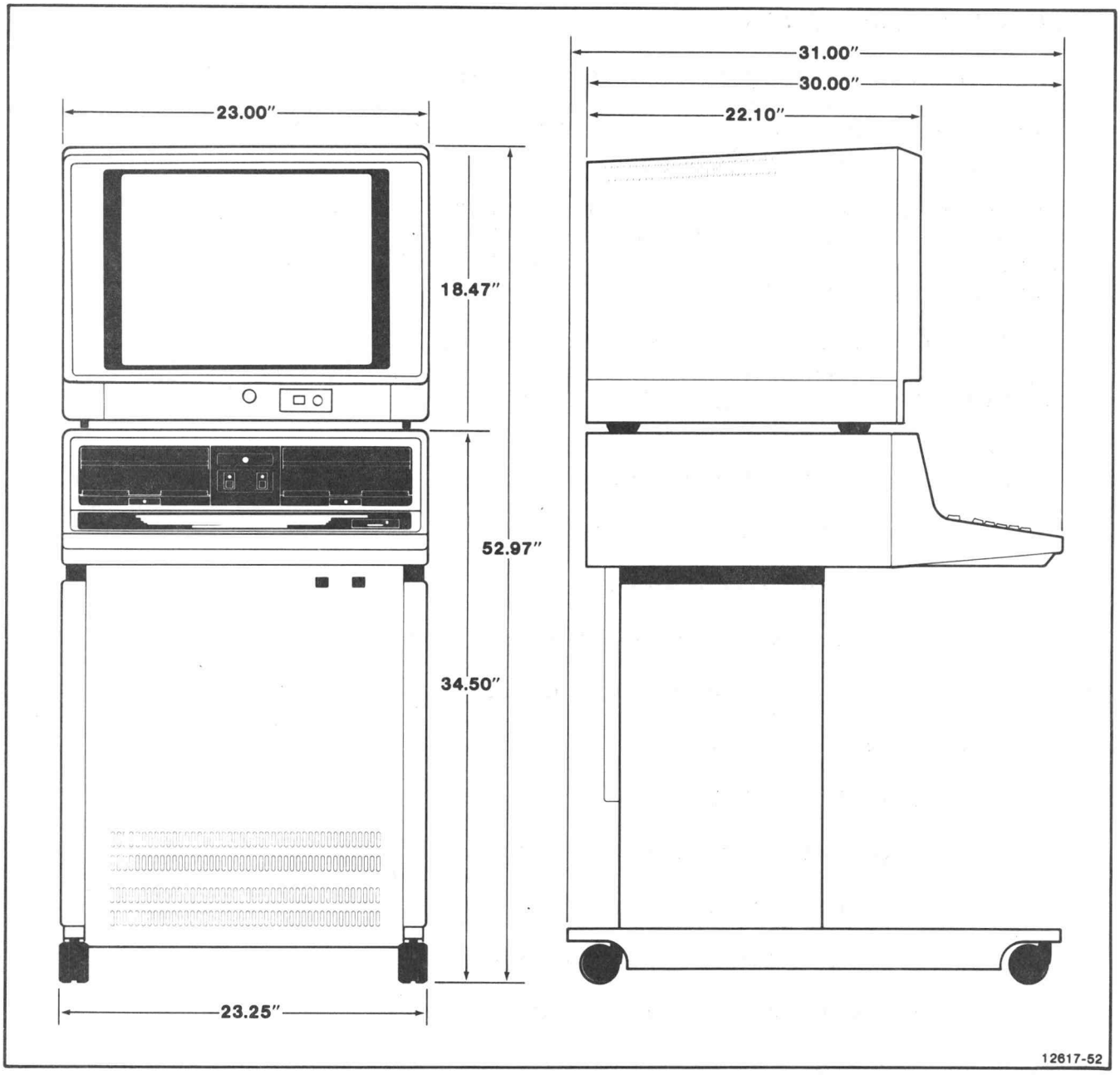


Figure A-1. 4113 Dimensions.

UNPACKING THE TERMINAL

The terminal is shipped in two cartons. The small carton contains the display module plus packing material. The large carton contains the pedestal, the ordered accessories, and some packing materials.

Before opening the cartons, gather these tools: a medium-size flat-bladed screwdriver, a carton opener (a small stout-bladed knife), and a medium-size--about two feet long--crowbar (pinch bar).

During the unpacking procedure, check the packing list against the terminal, accessories, and any options ordered to make sure that they agree. Refer to the following lists.

Standard accessories included with the 4113 are:

- 4113 Introduction Manual
- 4113 Operator's Manual
- 4110 Series Command Reference Manual
- 4113 Host Programmer's Manual
- Power cord set
- Host Port RS-232 cable
- Eight relegendable key caps
- Six function key overlays
- Display interconnect cables
- Two convergence drawer keys

Optional accessories are:

- Relegendable key caps
- Function key overlays
- 411X Logic Extender board
- RS-232 Loopback Connector
- 4113 Service Manual Volume 1

- 4113 Service Manual Volume 2
- 4113 Display Module Service Manual
- 4110 Series Desk Configuration Service Manual (When the terminal is a 4113-30)
- 4110 Series Option 10 Three Port Peripheral Interface (3PPI) Manual (when Option 10 is installed)
- 4110 Series F13/14 Graphic Tablets Instruction Manual (when Option 13 or 14 is installed)
- 4110 Series F42/43 Flexible Disk Drives Service Manual (when Options 42 or 43 are installed)
- 119-0977-00 Flexible Disk Drive Instruction Manual
- 067-1107-00 Test Graticule

Before beginning the unpacking procedure, carefully inspect both shipping cartons for any signs of damage. Report any damage to the carrier and the local Tektronix sales representative immediately.

WARNING

Both shipping cartons are HEAVY. Two people should do the lifting necessary to install the terminal. Please use proper lifting techniques to avoid bodily injury or damage to the terminal.

1. Use the carton opener to cut the plastic straps on the pedestal carton. Lift the carton straight up and over the pedestal. Note that the packages containing the standard accessories are placed on top of the packing material protecting the top of the terminal. Look in the carton for these packages if they are not seen immediately on top of the terminal. Remove any packing material from the top of the terminal.

2. The pedestal is secured to the shipping pallet by two boards that are power-stapled over the roller legs both in front and in back of the lower portion of the pedestal. Use the crowbar to pry both boards loose from the pallet structure.

WARNING

The sharp ends of the staples in the two boards need to be placed a safe distance away from all foot traffic.

3. Lift the pedestal off the pallet and set it down. Remove the pallet from the immediate area.

4. Lift the display module carton onto a table or other suitable surface near the pedestal.

5. Open the top of the carton with the carton opener and remove the packing material. Slit the carton at three of its vertical edges; then remove the display module from the carton and set it on the pedestal top. (Save the shipping cartons and packaging material in case the terminal needs to be shipped again.)

CHECKING THE OPERATING VOLTAGE

The terminal has two yellow voltage indicators that should be checked to see that the terminal is set to the proper ac power supply for the site. Make sure that the indicator on the pedestal and the one on the display module both are set to show the same value and that the value is correct. These yellow indicators are located on the back of each unit near the ac power receptacles. (Note that changing the yellow indicator does not change the internal voltage settings.)

CAUTION

If the terminal is not set for the proper operating voltage, and the terminal is connected to a voltage different from what it is set for, serious damage to the terminal may occur.

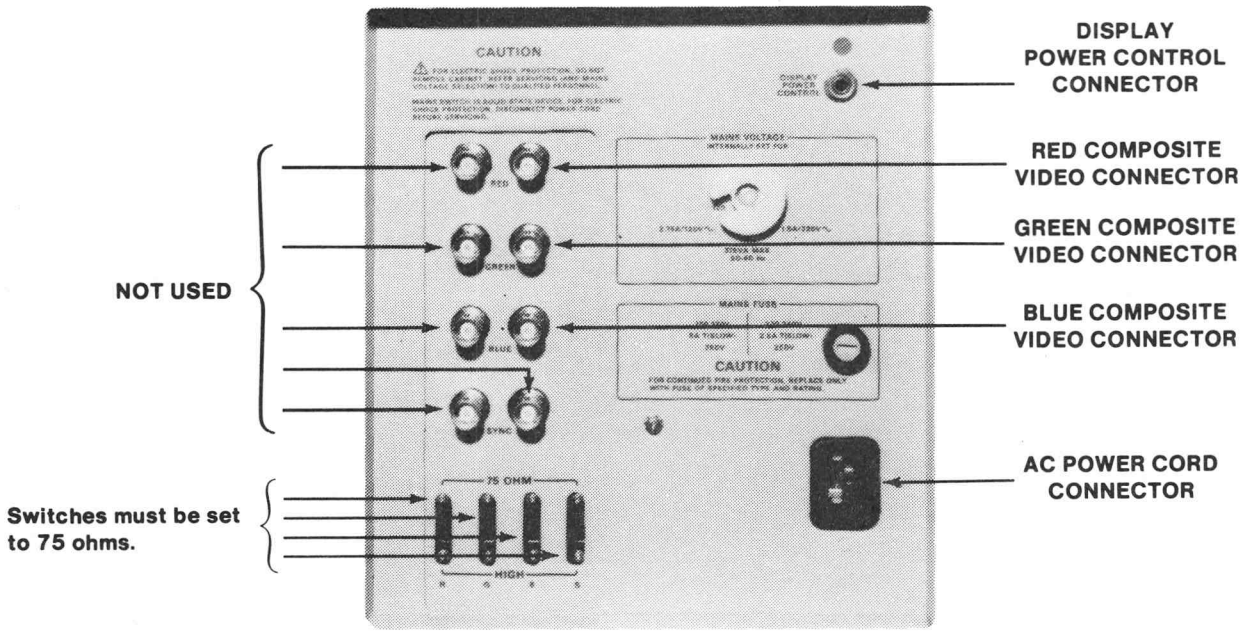
CAUTION

Installation of new options and changing the operating voltages for the 4113 should be done by qualified service personel only.

CONNECTING CABLES AND APPLYING POWER

There are five cables connecting the pedestal and display module--the ac power cable, the display power control cable, and three BNC-to-BNC coaxial cables. In addition, the pedestal has an ac power cable connecting it to a power outlet and a RS-232 communication cable connecting it to a modem or directly to the host computer. The 4113 should be operated only with all of these cables properly connected (the host port RS-232 cable need not be connected when the terminal is locally tested).

A. Display Plate.



B. Pedestal/Desk Plate.

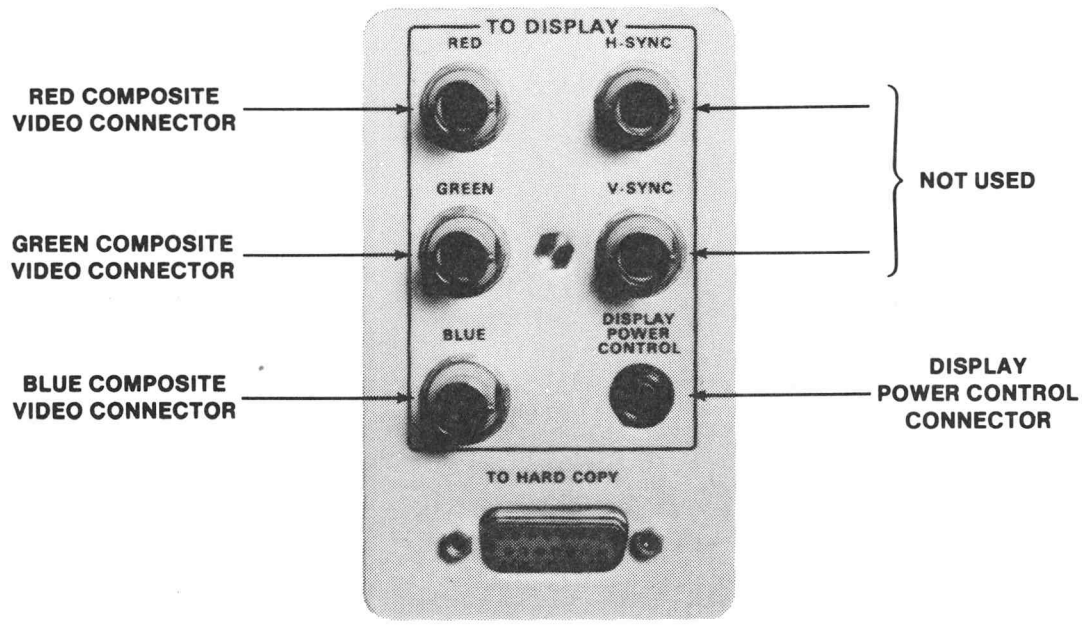


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Figure A-2. Pedestal-to-Display Interconnect.

1. Refer to Figure A-2 and attach the three BNC-to-BNC cables and the display power control cord from the pedestal to the display module. Make sure the BNC-to-BNC cables are matched to their respective color. For example, one end of the BNC cable must be connected to the BNC connector designated "RED" on the display, and the other end must be connected to the BNC connector designated "RED" on the pedestal. The same applies to the connectors marked "GREEN" and "BLUE".

2. Place the four switches on the rear of the display to the 75 ohm position.

3. Make sure the power button on the front of the terminal is in the OFF position. Then plug the ac display power cable into the pedestal and the display module. Figure A-2 shows where to plug the cable into the display. The other end of the cable is plugged into the rear heatsink of the pedestal. Connect the remaining AC power cable to the pedestal (again in the rear heatsink) and an ac power outlet.

4. Push in the power button. Wait a few minutes until all keyboard LEDs extinguish. The ventilation fans will be heard as the terminal is first energized.

TESTING THE TERMINAL (SELF TEST)

NOTE

More about Self Test is found in Appendix D. The following procedures are just for verification of correct operation of the terminal. If the terminal fails to pass one of the two versions of Self Test, the keyboard bell will ring and an error code stays lit on the keyboard LED lights. To decode the error, consult Appendix D.

When the terminal is turned on, it runs through a power-up, Self Test routine. This routine tests about 30% of the circuitry in the terminal. If a malfunction is found during the power-up routine, a malfunction message appears on the eight keyboard LEDs. The LED light patterns are interpreted as a two digit hexadecimal number. The righthand four LEDs (bits) form the least significant hexadecimal digit, and the lefthand four LEDs (bits) form the most significant hexadecimal digit.

For first time operation, a more detailed version of Self Test should be run. A brief outline of how to perform this test follows. Refer to Appendix D of this manual for more information and for error code tables.

1. Apply power to the terminal.

2. Press the SELF TEST button (located under the keyboard at the righthand top of the pedestal) and hold it down.

3. Press the MASTER RESET button (located next to the SELF TEST button) and release it.

4. After the keyboard LEDs begin to cycle, release the the SELF TEST button.

5. The keyboard LED lights will cycle twice and the keyboard bell will ring. When this happens, the user is to press any single key. After pressing a key, the terminal should continue with Self Test (it may wait a few seconds before continuing, though).

6. When the terminal continues running Self Test, it will display the different light codes of the tests as it runs them. If an error is found, the keyboard bell will ring twice and the light code will stay lit on the LEDs. Some of the tests that Self Test performs are rather long. The light codes for those tests may remain lit for several seconds while the test is running. THIS DOES NOT INDICATE AN ERROR. An error will be accompanied by the keyboard bell ringing twice. In a fully optioned terminal, Self Test can take up to six minutes to run.

7. When Self Test is finished running, the keyboard LEDs will be extinguished.

Upon completion of steps 1 through 7, 70% of the terminal circuitry has been tested. Proper terminal operation has been verified.

CONNECTING TO A HOST COMPUTER

The Host Port RS-232 Cable may be connected to the host computer in three ways that largely depend on the distance between the terminal and the host computer. In the first way, the cable may be plugged directly into the host computer (although usually an asynchronous modem eliminator is needed). In the second way, the cable may be plugged into a "short haul" modem or line driver device. This method is used when the host computer is in the same building or building complex, but not in the same room or immediate area. The third way uses a telephone line connection between modems.

Telephone Line Connection

A modulator-demodulator (modem) is required to establish a telephone line connection. There are a number of specialized modems available. The type required depends upon the specific needs of the installation.

A host port RS-232 cable is included with the 4113 as a standard accessory. To connect to a modem, connect one end of the RS-232 cable to the plug on the rear of the 4113 designated "To Modem". Connect the other end of the cable to the modem to be used.

Once the terminal is connected to the modem, a standard procedure for connecting to the computer is as follows (this procedure may vary in some details for different computer installations):

1. Power-up the equipment.

2. Dial the number of the computer installation.

3. When the computer responds with an audible tone, place the telephone headset on the cradle provided in the modem, or push the button marked DATA and hang up the headset, or perform such other function as required by the modem in use.

4. Perform the sign-on procedure to the computer as required by the particular computer installation.

TESTING COMMUNICATION

Once the terminal has been connected to the computer (in any of the three basic ways using the RS-232 cable), perform the sign-on ("log-in", "log-on") procedure that is required by the host computer. Once the user has "signed-on" to the system, the communication lines between the host computer and the terminal should now be open. The user can now "talk" to the computer. The user should try a few of the basic system commands to ensure that no communication problems exist between the terminal and the host computer.

Testing the communication provides the final verification of proper operation. The 4113 is now ready for use.

Appendix B

4113 SIGNAL LIST

The following is a signal list of all the 4113 signals on the schematics in Section 5 of Volume 2 of this manual.

Signals can originate and terminate on the same board, going from schematic to schematic (example: A8-1;A8-4 originates on page 1 of the Vector Generator board schematics and terminates on the page 4 schematic of the same board). Signals may have more than one destination. There may also be more than one signal with the same name (example: There is a WALU0-0 signal going from schematic A9-6 to schematics A9-2 and A9-3. There is also another signal on the Dual Raster Memory board also called WALU0-0). Usually signals with the same name perform the same function or close to the same function. In the cases where signals with the same name perform a different function, a second definition is given.

A number of the signals are terminated on the Color Map board (since this board is installed in the last slot of the Raster Bus). In some cases where a signal is not used, it may be tied to an inactive state (usually a logical high) on the Color Map board.

In the following list the microprocessor unit is abbreviated MPU.

Signal	Source; Destination	Explanation
1STINTA-0	A2A1-2; A2A1-1	First Interrupt Acknowledge. This Processor board signal indicates when the first of two interrupt acknowledge (INTA) cycles is occurring. Only the second INTA contains useful information.
50Hz-0	A7A1-3;A7A1-2, A9-1	The 50Hz-0 line can be strapped for either a 50Hz or 60Hz refresh rate (60Hz American; 50Hz European).
A0-1 thru A19-1	A2A1-2;A2A1-3, 4,5 A4A1-1;A4A1-3 A6-1;A6-2	(Local) Address (bits 0 through 19). This is the processor board address bus. It is created in the address drivers block from the MPU AD0-AD19 outputs. Note that some of these bits appear also on the RAM/ROM and RAM Controller boards with similar functions.
A15-0	A4A1-1;A4A1-3	A15-0 is the inverted local address line A15-1 and is used as a decoder bit for the ROM address decode section.
A6-1 thru A0-1	A9-4;A9-5 A10-4;A10-5	Demultiplexed address for raster memory RAMs.

Signal	Source; Destination	Explanation
ACCREAD-0	A8-1;A8-3	Decoded read strobe for slope generator RA register (at address F702).
ACK1-0	A4A1-1,A7A1-1; A2A1-1	Acknowledge 1. This system bus signal can be used as a slave response for no MPU wait states. The Processor board uses ACK1 to terminate a bus data transfer when it detects a bus timeout condition from the bus timeout detector circuitry (This signal can be output from the RAM/ROM board also).
ACK2-0	A4A1-1,A6-1; A2A1-1	Acknowledge 2. ACK2 serves as an advanced transfer acknowledge. The signal derives from SACK-0 which is output by the timing and control block inside the dynamic RAM controller. SACK-0 indicates the beginning of a memory access cycle.

Signal	Source; Destination	Explanation
AD19-1 thru AD0-1	A2A1-1,2; A2A1-2	(MPU) Address/Data (bits 0 through 19). These signals are the time-multiplexed memory I/O address and data bus output from the MPU. These bits are also input for data.
ADIS-0	J357;A8-2	Address Disable. ADIS-0 is a square pin test signal on J357-3. When ADIS-0 is tied low, the address outputs of the 2911 state sequencer chips will be tri-stated.
ADR0-1 thru ADR19-1	A2A1-2;A4A1-1, A6-1,A7A1-1, A8-1,A9-6, A10-6,A11-1	(System) Address (bits 0 through 19). These are the system bus address lines
AIOWC-0	A2A1-2;A2A1-1, A8-1,A11-1	Advanced I/O Write Command. This signal gives system bus I/O devices early indication of a write instruction. The timing is the same as a read command.
ALE-1	A2A1-2; A2A1-3	Address Latch Enable. ALE-1 strobes an address into the ADE block. It also synchronizes the Microprocessor Timing Generator, and deglitches the ROM bank decoder.

Signal	Source; Destination	Explanation
ALL-1	A8-5;A8-5 (internal to the schematic)	Output of the index control register. This causes the pixel write logic to generate a PWRT-0 on the raster bus for every PRQST-1.
AMWC-0	A2A1-2; A2A1-1,A6-1	Advanced Memory Write Command. AMWC-0 gives early indication of a write instruction to the system bus memory. The timing is the same as a read command--MRDC.
AWT-0	A2A1-1; A2A1-2,4,5	Advanced Write. This is the advanced write command to all on-board devices. AWT-0 is derived from the MPU status lines and the Microprocessor Timing Generator.
BANK0-0	A8-5;A8-5 (internal to the schematic)	Output of the index control register. This signal selects which bank of the index file is currently in use.
BANKIN-0	A6-2;A6-1	BANKIN-0 is used in the address decoding logic on the RAM Controller board to indicate the presence or absence of a RAM Array board.

Signal	Source; Destination	Explanation
BANKSELECT-1	A8-2;A8-2 (internal to the schematic)	A signal which selects which half of the microcode ROMs to be used for the requested routine (most significant bit of the op-code).
BBCLK-1	A2A1-A;A2A1-5	Buffered Bus Clock. BBCLK is a 4.9152 MHz signal which synchronizes the bus transfer logic and is the frequency source for the Programmable Timer and (Transmit) Baud Rate Generator block. This signal is the invert of BCLK-0.
BCLK-0	A2A1-1;A2A1-1, P101	Bus Clock. BCLK-0 is the system bus clock. It is a 4.9152 MHz square wave and is used by bus devices to synchronize bus master transfers. It is also used as a stable frequency source.
BHE-0	A2A1-1;A2A1-2	BHE-0 is a the low side of S7-1/BHE-0. BHE-0 is latched and then driven on to the system bus as BHEN-0 (see S7-1/BHE-0 and BHEN-0). BHE-0 is the local Processor board version of BHEN-0.

Signal	Source; Destination	Explanation
BHEN-0	A2A1-2;A4A1-1, A6-1	Byte High Enable. On the Processor board, BHE is latched and then driven onto the System bus as BHEN-0. BHEN-0 enables the high byte (D8-D15) on read, write, and interrupt acknowledge cycles.
BIN-1	A8-5;A8-5 (internal to the schematic)	Beam In. This signal is the logical "AND" of XIN-1 and YIN-1. This signal tells the memory control logic that the current beam position is on the screen.
BLANK-0	A7A1-3; A7A1-1,2	BLANK-0 is a video blanking signal from the Video Timing Generator block. BLANK-0 controls blanking during horizontal and vertical retrace.
BLOCKMOVEDEST-1	A9-1;A9-2,3 A10-1;A10-2,3	Block Move Destination. The BLOCKMOVEDEST-1 signal is high during a vector cycle called Block Move Destination.

Signal	Source; Destination	Explanation
BLUSYNC-0	A11-2;A11-3	BLUSYNC-0 is a composite sync signal. This signal is used by the BLUE DAC section on the Color Map board to synchronize to the RED and GREEN DAC sections on the same board.
BMP0-0 thru BMP2-0	A9-1;A9-2,3 A10-1;A10-2,3	Buffered bus signals of MP0-0 through MP2-0.
BPRN-0	J104;A2A1-1	Bus Priority In. BPRN is a signal from the bus priority logic on the Mother board that informs a potential bus master board that it has permission to become bus master.
BREF-0	A9-1;A9-1 A10-1;A10-1 (internal to the schematic)	Buffered REF-0 signal.
BREQ-0	A2A1-1;A1-2	Bus Request. BRQ is a signal from a potential bus master board to the bus priority logic on the Motherboard that indicates that the potential bus master board needs to become the actual bus master.

Signal	Source; Destination	Explanation
BUSAEN-0	A2A1-1;A2A1-2	Bus Address Enable. BUSAEN-0 indicates that a board is bus master of the system bus. BUSAEN-0 is input to the Address enable of the bus controller chip, as well as an enable to the address drivers. BUSAEN-0 enables the bus controller to output the bus commands MRDC, MWTC, AMWC, IORDC, etc. BUSAEN-0 is gated with INTA and input to the INTA input of the programmable interrupt controller.
BUSGRT-0	P104;A2A1-1	Bus Grant. BUSGRT-0 acts as a preset for the bus transfer logic, causing BUSY-0 to be output.
BUSGRT-1	A2A1-1;A2A1-5	Bus Grant. This signal is similar to BUSAEN, but has a slight timing difference. This signal enables data to be latched onto the data lines.

Signal	Source; Destination	Explanation
BUSY-0	A8-2;A8-2 (internal to the schematic)	Output of the opcode flag. This signal is set true by an I/O write to the opcode register and set false by the state sequencer (signal CBUSY-0). This flag can be tested by the state sequencer and is used to start execution of the micro-opcode routine as requested through opcode.
BUSY-0	A2A1-1;A2A1-1	BUSY-0 indicates that a bus master is currently using the system bus. BUSY-0 delays bus master transfer until the current bus master is done.
BVCLK1-1	A8-3;A8-1,2	Buffered vector clock from the raster bus (buffers VCLK-0).
BVCLK2-1	A8-3,A8-1,4,5	Buffered vector clock from the raster bus (buffers VCLK-0).
BVCLK3-1	A8-3;A8-4	Buffered vector clock from the raster bus (buffers VCLK-0).
BVCLK4-1	A8-3;A8-2	Buffered vector clock from the raster bus (buffers VCLK-0).

Signal	Source; Destination	Explanation
C2-1, C1-1, & C0-1	A8-2;A8-5	Counter. These signals act as a three bit control field from the state controller. These signals then select the mode for the counter control logic.
CAS-0	A6-1;A6-2 A4A1-1;A4A1-3	Column Address Strobe. This signal is generated by the Dynamic RAM Controller on both RAM/ROM and the RAM Controller boards. CAS-0 strobe the seven multiplexed column address bits appearing on RA0-1 thru RA6-1 (RAM address lines) on the RAM Array board.
CAS-1	A7A1-2;A9-1, A10-1	From RAM timing block. Column address strobe for the RAMs.
CAS0-1 thru CAS4-0	A9-1;A9-4,5 A10-1;A10-4,5 RAM.	Column Address Strobes for RAM.
CBLANK-0	A7A1-3;A7A1-4	Cursor blanking. CBLANK-0 originates in the Video Timing Generator. CBLANK-0 blanks the cursor during retrace.

Signal	Source; Destination	Explanation
CBRQ-0	A2A1-1;A2A1-1	Common Bus Request. CBRQ-0 is used by potential bus masters to request bus mastership from higher priority bus masters. CBRQ-0 is generated by the Processor board along with BRQ (both of these signals are outputs of the same flip-flop). The Processor board then listens to CBRQ-0 and gives up the bus when another board asserts CBRQ-0.
CBUSY-0	A8-2;A8-3	Clear Busy flag. This state controller signal clears the busy flag that is set by writing an opcode to the Vector Generator.
CBUSY-0	P286;A7A1-1	(Hard) Copy Busy. From the Hard Copy Unit. Indicates that the HCU is busy making a copy.
CCREAD-0	A8-1;A8-5	Decoded read strobe for the index control register (at address F71A).

Signal	Source; Destination	Explanation
CDAT-0	A8-2;A8-5	Clear New Data flag. This state controller signal clears the New Data flag that is set by an I/O write to the Index file.
CLK-1	A2A1-1;A2A1-2	Clock. CLK-1 is a direct output of the Clock Generator IC. It outputs a 4.9152 MHz square wave with a one third duty cycle. All blocks that must be synchronized with the local processor bus use this signal.
CLKDIS-0	----;A4A1-1 P166;A6-1	Clock Disable. A TTL logic low level applied to this input pin disables the clock circuitry on the RAM/ROM or the RAM Controller board. (This is a test point for factory use only).
CLR1-0	A8-1;A8-2,5	Buffered reset signal which is the "OR" of (1) the bus reset (RESET-0), (2) the square pin reset (INIT-0), and, (3) the software reset (I/O write to address F71E).

Signal	Source; Destination	Explanation
CLR2-0	A8-1;A8-2	Buffered reset signal which is the "OR" of (1) the bus reset (RESET-0), (2) the square pin reset (INIT-0), and, (3) the software reset (I/O write to address F71E).
CLR3-0	A8-1;A8-4,5	Buffered reset signal which is the "OR" of (1) the bus reset (RESET-0), (2) the square pin reset (INIT-0), and, (3) the software reset (I/O write to address F71E).
CMD-1	A2A1-4;A2A1-5	Command. CMD-1 is the logical OR of RD and AWT on the Processor board.
CNT1READ-0	A8-1;A8-2	Decoded read strobe for the 12 bit counter (at address F70E).
COL-1	A7A1-2;A9-4, A10-4,A11-2	From RAM timing, controls the ROW/COLUMN address multiplexer on the Raster Memory board. On the Color Map board, COL-1 is used by the Sync Generator section as a clock.

Signal	Source; Destination	Explanation
COLORMAP-1	A11-3;A11-1	From the Cursor Control section. This signal is used select one of two inputs for the multiplexers in the Color Map section of the Color Map board.
COMINT-0	A2A1-5;A2A1-2	Communications Interrupt. COMINT-0 is the RS-232 Communications Interface received character interrupt signal. Other RS-232 interrupts are included in the TIMERINT signal.
CSR-0	A8-2;A8-5	Clear Shift Register flag. This state controller signal clears the new shift register flag (the flag is set by an I/O write to SR1).
CTS-1	P102;A2A1-5	Clear To Send. CTS-1 is an RS-232 status input.
CURCLK-1	A7A1-2;A7A1-4	Cursor clock. CURCLK-0 originates in the Pixel Timing block and serves to clock the Cursor Video D flip-flop.

Signal	Source; Destination	Explanation
CURSOR-1	A7A1-4;A11-3	CURSOR-1 is the output of the Cursor Video section of the Video Controller board. This signal tells the Cursor Control section of the Color Map board when a cross-hair cursor is being generated. When a pixel is part of this crosshair cursor, CURSOR-1 will be a TTL high.
CURSORCLK-0	A11-1;A11-3	This clock is DCLK-1 changed from an ECL level to a TTL level. It is used to clock the Cursor Control section of the Color Map board.
CURSYNC-0	A7A1-1;A7A1-4	Cursor syncronizing pulse. CURSYNC-0 originates in the pixel timing block and serves to keep the cursor syncronized to the pixel timing.
D0-1 thru D19-1	A9-3;A9-5 A10-3;A10-5	20 bits of RAM memory input data.
D15-1 thru D0-1	A2A1-2;A2A1-3, 4,5 A8-1,2,3,4,5	(Local) Data (Bus). These lines are the local data bus for the Processor board and the Vector Generator board.
D11-1 thru D0-1	A11-1;A11-3	This is the local data bus for the Color Map board.

Signal	Source; Destination	Explanation
DAC1-1 thru DAC3-1	----;A7A1-4	Digital/analog converter signal. (These lines are not used by the 4113).
DAT0-1 thru DAT15-1	A2A1-2;A4A1-2, A4A1-3,A6-2, A7A1-1,4, A8-1,A9-1,2, 3,6,A10-1, 2,3,6, 11-1	(System) Data (Bus). These lines are the system data bus, (Bidirectional on most boards).
DATFE-0	A4A1-3;A4A1-1	Acts as an input to the ROM Decode section of the RAM/ROM board. DATFE-0 informs the ROM Decoder logic that the upper four banks of ROM are being addressed.
DCD-1	P102;A2A1-5	Data Carrier Detect. DCD-1 is an RS-232 status input.
DCLK-1	A7A1-2;A9-6, A10-6,A11-1,3	Dot (or dash) Clock. 25 MHz Clock for dot (or dash) pattern. Originates in Master Clock block of the Video Controller board. DCLK-1 occurs once per pixel.
DCRY-1	A7A1-2;A7A1-3	Dot carry clock. From the Pixel Timing block. DCRY-1 is the master clock for the CRT controller IC.

Signal	Source; Destination	Explanation
DDA-0	A8-2;A8-3	Slope Generator Enable. This is a state sequencer signal which allows the slope generator to function.
DIN15-1 thru DIN0-1	A4A1-2;A5-1 A6-2;A5-1	Data In bits 0 through 15. During RAM write operations, these 16 data bits contain the data that is written to RAM on the RAM Array board.
DINLSB-0	A6-1;A6-2	Data Input Enable Least Significant Byte. During RAM write operations, DINLSB-0 enables the data input buffer for the least significant byte of data to drive data from the bus onto RAM data lines DIN7-1 thru DIN0-1 to the RAM Array boards.
DINMSB-0	A6-1;A6-2	Data Input Enable Most Significant Byte. During RAM write operations, DINMSB-0 enables the data input buffer for the most significant byte of data to drive data from the bus onto RAM data lines DIN15-1 thru DIN8-1 to the RAM Array boards.

Signal	Source; Destination	Explanation
DOUT-0	A6-1;A6-2 A4A1-1;A4A1-2	Data Output Enable. During RAM read operations, DOUT-0 enables the Data Output Latches to output their data to the system bus.
DOUT15-1 thru DOUT0-1	A5-1;A4A1-2 A5-1;A6-2	Data Output bits 0 through 15. These 16 data bits from the RAM Array board contain the RAM data output bits during RAM read operations.
DPC	A11-2;J3005	Display Power Control. The Display Power Control signal activates a Solid State Relay in the display module whenever the Pedestal/Desk is turned on.
DSR-1	P102;A2A1-5	Data Set Ready. DSR-1 is an RS-232 status input.
DT-1/R-0	A2A1-2;A2A1-4	Data Transmit/Receive. DT-1/R-0 is a direct output of the bus controller. A high on this line indicates a WRITE to I/O or memory and a low is a READ.
DTR-1	A2A1-5;P102	Data Terminal Ready. DTR-1 is an RS-232 status output.

Signal	Source; Destination	Explanation
DY0-1 and DY1-1	A9-6;A9-6 A10-6;A10-6 (internal to the schematic)	Border latch output bit.
DYENB-0	A8-2;A8-4	Delta Y Enable. This state controller signal selects the Delta Y counter instead of the Y counter to send to the raster bus.
EARLYCARRY-0	A7A1-2;A7A1-3	Early Dot Carry clock. Early Dot Carry clock from the Pixel Timing block. EARLYCARRY-0 is used to help generate the PAUSE-1 signal.
EBLANK-0	A7A1-3;A7A1-4	ECL blank (EBLANK-0 is not used by the 4113).
ECLR-0	A7A1-2;A7A1-4	ECL generated clear pulse. Clear pulse from the RAM Timing. ECLR-0 is used to control Y-cursor blanking.
ENB12-0	A8-2;A8-2 (internal to the schematic)	Enable 12 Bit Counter. A state controller signal which enables the 12 bit counter to decrement.

Signal	Source; Destination	Explanation
ENB8-0	A8-2;A8-1	Enable 8 Bit Counter. This state controller signal allows the 8 bit counter to decrement.
EQ-1	A9-2;A9-3 A10-2;A10-3	A-B line from the ALU ICs on the Dual Plane Raster Memory board. This signal is used to generate EQUAL-1 (see EQUAL-1).
EQUAL-1	A9-3,A10-3; A8-2	EQUAL-1 is a signal to the Vector Generator board indicating that both input ports of the raster ALU are equal (provided the ALU mode is set to XNOR).
ESYNC-0	A7A1-3;A7A1-4	ECL synchronization pulse. (Not used by the 4113).
EXT BLUE	A11-3;P423	EXT BLUE is the composite video blue signal available at P423 for external use. Scanning is non-interlaced.
EXT GREEN	A11-3;P423	EXT GREEN is the composite video green signal available at P423 for external use. Scanning is non-interlaced.

Signal	Source; Destination	Explanation
EXTHSYNC-0	A11-2;P423	EXTHSYNC-0 is a horizontal sync signal (occuring 525 times per frame) available for external use. A jumper strap enables this signal to be true high or true low.
EXT RED	A11-3;P423	EXT RED is the composite video red signal available at P423 for external use. Scanning is non-interlaced.
EXT VIDEO	A11-3;P426	EXT VIDEO is a monochrome video signal which is a weighted summation of the RED, GREEN, and BLUE composite video signals. This signal is non-interlaced and available for external use.
EXTVSYNC-0	A11-2;P423	EXTVSYNC-0 is a vertical sync signal available for external use. A jumper strap enables this signal to be true high or true low.
EXLD-0	P281;A7A1-3	Causes CRT controller to go through self-booting sequence.
EXT-0	J382;A9-2, A10-2.	Not currently used.

Signal	Source; Destination	Explanation
FIRST-0	A8-1;A8-5	This signal is true after the X axis counter is loaded and is goes false when the X axis is counted. It is used to identify the first column of a wipe or blockmove.
FMAT-0 & FMAT-1	A8-2;A8-2 (internal to the schematic)	Format. A state controller signal which schematic) controls which latches the microcode ROM data will be latched into.
GREENSYNC-0	A11-2;A11-3	GREENSYNC-0 is a composite sync signal. This signal is used by the Green Dac section on the Color Map board to synchronize to the Blue and Red Dac sections.
HC VIDEO	A11-3;P425	HC VIDEO is a monochrome composite video signal used for hard copy operation. It is a weighted summation of the outputs of the Red, Green, and Blue Amplifier sections.
HSYN-1	A7A1-3;A7A1-4	Horizontal video synchronization pulse. HSYN-1 is used to syncronize the monitor (J361 must be in place).

Signal	Source; Destination	Explanation
HSYNC-0	A7A1-3;A11-2	Horizontal video synchronization pulse. Invert of HSYN-1. Used by the Sync Generator section on the Color Map board.
IDIS-0	J357;A8-2	Instruction Disable IDIS-0 is a square pin test signal on J357-2. When IDIS-0 is tied low, the outputs of the micro-opcode decoder ROM will be tristated.
IN-0	A4A1-2;A5-1	IN-0 is used with OUT-0 to indicate the presence or absence of a RAM Array board
INH-0	A8-5;A8-5 (internal to the schematic)	Inhibit. The ZERO-0 signal from the 12 bit qualified by the ZENB-0 signal from the state controller. INH-0 serves to inform the counter control and memory control logic of the end of a vector.

Signal	Source; Destination	Explanation
INH-0	A6-1;A4A1-1	(Read) Inhibit. When true low, INH-0 inhibits memory circuitry from outputting its data onto the system bus during a read operation of the memory circuitry (see INHIBIT-0). INH-0 may be output by test circuitry. INH-0 is not currently used.
INIT-0	A13A1-1; A2A1-1,4, A4A1-1, A7A1-3,A8-1	Initialize. INIT is used to generate reset which goes directly to the MPU and does a power-up reset operation. It also resets much of the sequential logic on the Processor board, as well as reseting logic on the RAM/ROM, Video Controller, and Vector Generator boards.
INT-0	A7A1-1;P280	Interrupt request.
INT0-0 thru INT7-0	---;A2A1-2	Interrupt 0 through 7. INT0-1 thru INT7-0 are interrupt request signals to the Processor board. INT0-0, INT4-0, or INT5-0 can be generated by processor board devices.

Signal	Source; Destination	Explanation
INTA-0	A2A1-1; A2A1-1,2	Interrupt Acknowledge. INTA-0 notifies the Programmable interrupt controller that its interrupt is acknowledged and it can put vectoring data on the system data bus.
INTA-0	A2A1-2; A2A1-1,2	Interrupt Acknowledge. INTA-0 is generated on the Processor board and is received by slave programmable interrupt counters (PICs) on other boards. INTA-0 notifies the slave PIC that its interrupt is acknowledged and it can put vectoring data on the system data bus.
INTERNAL-0	A9-2;A9-1,3 A10-2;A10-1,3	Indicates where the input data for the B side of ALU comes from. 0 says data is from internal PDAT latches. 1 says data comes from an off board source. Always zero in the 4113 since there are no outside sources.
INTERNAL-1	A9-2;A9-3 A10-2;A10-3	INTERNAL-1 is the invert of INTERNAL-0. It acts in the same manner as INTERNAL-0 but is not currently used.

Signal	Source; Destination	Explanation
INTR-1	A2A1-2;A2A1-1	Interrupt. INTR-1 is a direct output of the INT pin of the programmable interrupt counter in the Interrupt Controller block. The signal is input directly to microprocessor INTR input. INT is the interrupt to the microprocessor.
IORC-0	A2A1-2;A7A1-1, A8-1,A9-4, A10-6,A11-1	I/O Read Command. This signal when low indicates that an I/O device should drive its data onto the system bus.
IOWC-0	A2A1-2;A7A1-1, A8-1,A9-6, A10-6	I/O Write Command This signal when low indicates that an I/O device should read data from the system bus.
K19-1 thru K0-1	A9-2;A9-4 A10-2;A10-4	K19-1 thru K0-1 on Raster Memory boards has the same function as D19-1 thru D0-1 (20 bits of RAM input data).

Signal	Source; Destination	Explanation
KA0-1 thru KA3-1	A2A1-4;A3-1	Keyboard Address 0 through 3. These signal lines carry key matrix column addresses in addition to LED address and on-off information.
KBDINT-0	A2A1-4;A2A1-2	Keyboard Interrupt. This signal is the interrupt for the keyboard. It is output from pin 24 of the peripheral interface microprocessor and input to the Interrupt Controller block as INT4 into the programmable interrupt counter.
KBT1-1	P104;A2A1-4	Keyboard Test. KBT is the test input to the MPU Keyboard Controller.
KD0-1 thru KD7-1	A3-1;A2A1-4	Keyboard Data (Bits 0 through 7). These lines carry key matrix data in addition to thumbwheel Grey code data.
KSTRB-0	A2A1-4;A3-1	Keyboard Strobe. KSTRB-0 latches KA0-1 thru KA3-1 data into the Keyboard board circuitry.

Signal	Source; Destination	Explanation
KWR-0	A2A1-4;A3-1	Keyboard Write. KWR latches KA0-1 thru KA3-1 into the Keyboard circuitry that controls the LEDs.
L19-1 thru L0-1	A9-3;A9-6 A10-3;A10-6	Latch pixel data bits to the processor read latches. The bits are then latched in the block move latch for a processor read.
LAST-0	A8-1;A8-2,5	Zero count signal for the 8 bit counter.
LATCH-0	A9-1;A9-2,3 A10-1;A10-2,3	A low holds the previous RAM cycle output data in the block move latches. This data can then be used for the destination cycle of the block move.
LBHE-0	A2A1-2;A2A1-4	Latched Byte High Enable. LBHE-0 is the Processor board equivalent of the system bus signal, BHEN (Byte High Enable).
LINESYNC-0	A7A1-3;A7A1-2	LINESYNC-0 synchronizes the pixel timing to the video scan line.
LOADΔY-0	A8-1;A8-4	Decoded write strobe for delta Y axis register (at address F708).
LOAD-1	A7A1-2;A9-4, A10-6	Load enable for video shift registers.

Signal	Source; Destination	Explanation
LOADAXIS-0	A8-1;A8-3	Decoded write strobe for slope generator axis control register (at address F704).
LOADCC-0	A8-1;A8-5	Decoded write strobe for the index control register (at address F71A).
LOADCNT1-0	A8-1;A8-2	Decoded write strobe for 12 bit counter (at address F70E).
LOADCOL-0	A8-1;A8-5	Decoded write strobe for the index file (at address F718).
LOADMASK-0	A8-1;A8-5	Decoded write strobe for the mask file (at address F71C).
LOADOP-0	A8-1;A8-2	Decoded write strobe for the OPCODE register (at address F714).
LOADRA-0	A8-1;A8-3	Decoded write strobe for slope generator RA register (at address F702).
LOADRX-0	A8-1;A8-3	Decoded write strobe for slope generator RX register (at address F700).
LOADRY-0	A8-1;A8-3	Decoded write strobe for slope generator RY register (at address F706).

Signal	Source; Destination	Explanation
LOADSR1-0	A8-1;A8-5	Decoded write strobe for shift register 1 (at address F710).
LOADSR2-0	A8-1;A8-5	Decoded write strobe for shift register 2 (at address F712).
LOADX-0	A8-1;A8-4	Decoded write strobe for the X axis register (at address F70C). NOTE: there is another signal called LOADX-0 on the Video Controller board; see the following definition.
LOADX-0	A7A1-1;A7A1-4	Load the X-Cursor register.
LOADX-1	A8-4;A8-5	A positive logic version of the decoded write strobe for the X axis register (at address F70C).
LOADY-0	A8-1;A8-4	Decoded write strobe for the Y axis register (at address F70A). NOTE: there is another signal called LOADY-0 on the Video Controller board; see the following definition.
LOADY-0	A7A1-1;A7A1-4	Load the Y-Cursor register.

Signal	Source; Destination	Explanation
LOCK-0	A2A1-1;A2A1-1, J104	If LOCK-0 is low, it indicates that other system bus masters may not take control of the bus from the Processor board. This signal is manipulated by a "lock" prefix to any firmware instruction.
LS2-0 thru LS0-0	A2A1-2; A2A1-1,3,5	Latched Status 0 through 2. These signals are the latched outputs of the MPU S0--S2 signals. S0--S2 indicate what state the MPU is in--interrupt acknowledge, read IO, write IO, halt, code access, read memory, or write memory.
M1-1 & M0-0	A8-2;A8-5	Two state sequencer signals which, after buffering through two levels of latches, become MODE0-0 and MODE1-0 on the raster bus.
MAKECOPY-0	A7-1;HCU	Caused by the host or the Hard Copy Key going low. Initiates a hard copy cycle (makes a copy). Requires ground closure of TTL low for more than 1 ms.

Signal	Source; Destination	Explanation
MAP-0	A8-2;A8-2 (internal to the schematic)	Output of the micro-opcode decode ROM which enables the outputs of the opcode register.
MAP-0	A11-1;A9-6, A10-6	Map write select. MAP-0 acts to disable the VID3-1 thru VID0-1 lines as the Color Map is being written.
MAP-1	A9-6;A9-6 A10-6;A10-6 (internal to the schematic)	MAP-0 inverted. This is the local signal on the Raster Memory Plane boards that disables VID3-1 thru VID0-1.
MC2-1, MC1-1, & MC0-1	A8-2;A8-5	Memory Control. These signals act as a three bit control field from the state controller. These signals then select the mode for the memory control logic.
MDEN-1	J104;A2A1-3	Memory Data Enable. When driven low, this signal disables data drivers on the Processor board.

Signal	Source; Destination	Explanation
MODE0-1 and MODE1-1	A8-5;A9-1, A10-1	The four states of these "mode bits" define the memory cycles as follows: 00 (0) defines operate, 01 (1) defines block move from source, 10 (2) defines blockmove to destination, and 11 (3) defines processor read cycles. NOTE: MODE0-1 is the least significant bit.
MON BLUE	A11-3;A12-1	MON BLUE is the composite video blue signal used by the display module.
MON GREEN	A11-3;A12-1	MON GREEN is the composite video green signal used by the display module.
MONHSYNC-0	A11-2;A12-1	MONHSYNC-0 is a horizontal sync signal (occuring 525 times per frame) available for use at the rear panel. This signal is not currently used.
MON RED	A11-3;A12-1	MON RED is the composite video red signal used by the display module.
MONVSYNC-0	A11-2;A12-1	MONVSYNC-0 is a vertical sync signal available for use at the rear panel. This signal is not currently used.

Signal	Source; Destination	Explanation
MP4-0 thru MP0-0	A8-5;A9-1, A10-1	Pixel (addressable latch) address for memory planes. MP4-0 thru MP0-0 originates in the Vector Generator board and is used to latch the PDAT bits and RAS mask for a 20 bit RAM word. During a block move, the address lines become five lines that mask the five zones in a 20 bit word.
MRDC-0	A2A1-2; A2A1-1,A4A1-1, A6-1	Memory Read Command. MRDC-0 instructs memory to release data to the system bus.
MRQST-0	A8-5;A8-5 (internal to the schematic)	Memory Request. A signal from the memory control logic that requests a vector generator memory cycle. This signal becomes the raster bus signal VRQST-0 after passing through a buffer latch.
MVIDEO	A7A1-4;-----	Monitor video signal. (not used by the 4113)
MWTC-0	A2A1-2;P101	Memory Write Command. This signal indicates that memory should latch and store data on the system bus.

Signal	Source; Destination	Explanation
MX0-0 thru MX4-0	A7A1-3,A8-4; A9-4,A10-4	Multiplier X axis data. Latched data to the Memory Address Selector.
MY0-0 thru MY8-0	A7A1-3,A8-4; A9-4,A10-4	Multiplier Y axis data. Latched data to the Memory Address Selector.
N19-1 thru N0-1	A9-2;A9-6 A10-2;A10-6	N19-1 thru N0-1 on the Raster Memory boards has the same function as L19-1 thru L0-1 (pixel data bits; see L19-1 thru L0-1).
NEWDAT-0	A8-5;A8-2	New Data. This signal indicates a value has been written into the index file by the 8086. It is set true by the I/O write, and set false by COAT-0.
NEWSR-0	A8-5;A8-2	New Shift Register. A Signal which indicates that an I/O write to shift register 1 has occured.

Signal	Source; Destination	Explanation
NMI-0	J104;A2A1-1	Non-Maskable Interrupt. This is the non-maskable interrupt for the 8086 microprocessor. The 4113 system does not use it, but it is available for use by a test device via J104.
NMI-1	A2A1-1;J104	Non-Maskable Interrupt. This is NMI-0 inverted.
NRFND-0	A8-5;A7A1-1	Not ready for new data. NRFND-0 is a signal from the Vector generator to signal that it is not ready for new data.
OBADR-0	A2A1-3; A2A1-1,2	On-Board Address. OBADR-0 indicates that the 8086 microprocessor is accessing a device on the Processor board.
OBDEN-0	A2A1-3;A2A1-2	On-Board Data Enable. OBDEN enables the data transceivers during an on-board data access.
OBINTA-0	A2A1-2; A2A1-1,3	On-Board Interrupt Acknowledge. OBINTA-0 indicates that the programmable interrupt counter is generating an interrupt vector address.

Signal	Source; Destination	Explanation
OBIOX&X-0	A2A1-3; A2A1-1,2,4,5	On-Board IO (select) signals. Local address lines A0,A2, and A3 select one of eight signals: OBIOD&F, OBIOC&E, OBIO9&B, OBIO8&A, OBIO5&7, OBIO4&6, OBIO1&3, and OBIO0&2. These are used to enable the RCI, PT&BRG, IC, KC, BTD, or SI blocks. These signals are selected during Processor board IO reads and writes to X'00E0' through X'00EF'.
OBRAM-0	A2A1-3;A2A1-4	On-Board RAM. OBRAM-0 enables the CMOS RAM for a READ or WRITE operation.
OBROM-0	A2A1-3;A2A1-1	On-Board ROM. OBROM-0 enables the 32K of ROM on the Processor board for READ operations.
OUT-0	A5-1;A4A1-2,1 A5-1;A6-2	OUT-0 is used with IN-0 to indicate the presence or absence of a RAM Array board.

Signal	Source; Destination	Explanation
OUT0-1	A2A1-5;A2A1-1	Output 0. OUT0-1 is the output of a 16-bit programmable down counter. This provides variable timing delays for the system firmware. In the bus timeout detector block, OUT0-1 clocks the bus timeout counter whose output to the system bus is ACK1.
P0-0 thru P2-0	A9-1;A9-2,3 A10-1;A10-2,3	Decoded MP3-0 and MP4-0 signals used for the three addressable latch clocks.
PAUSE-1	A7A1-3;A7A1-2	Causes the 50 MHz clock to stop. PAUSE-1 enables the video controller to sync to an external sync signal.
PCARRY-0	A8-5;A8-5 (internal to the schematic)	Pixel Carry. Carry out of the pixel counter (an input to the counter control logic).
PCLK-1	A7A1-2;A7A1-1	Power Supply synchronizer clock.
PDAT0-1	A8-5;A9-3, A10-3	Raster Memory plane 0 RAM data bit input line (PDAT0-1 can be strapped to be accepted by either Raster Memory board).

Signal	Source; Destination	Explanation
PDAT1-1	A8-5;A9-2, A10-2	Raster Memory plane 1 RAM data bit input line (PDAT1-1 can be strapped to be accepted by either Raster Memory board).
PDAT2-1	A8-5;A9-3, A10-3	Raster Memory plane 2 RAM data bit input line (PDAT2-1 can be strapped to be accepted by either Raster Memory board).
PDAT3-1	A8-5;A9-2	Raster Memory plane 3 RAM data bit input line (PDAT3-1 can be strapped to be accepted by either Raster Memory board).
PINH-0	A8-5;A8-5 (internal to the schematic)	Pipelined Inhibit. The PZERO-0 signal from the 12 bit counter qualified by ZENB-0 signal from the state controller. PINH-0 also serves to warn the memory control logic of the end of a vector.
PIPELINE-0	A8-2;A8-2 (internal to the schematic)	The output of the micro-opcode decode ROM which enables the outputs of the pipeline address latch.
PIX-1/MSK-0	A8-2;A8-5	This state controller signal selects either the pixel counter or mask file data to send to the raster bus.

Signal	Source; Destination	Explanation
PIXCNTENB-0	A8-5;A8-5 (internal to the schematic)	Pixel Counter Enable. Output of the counter control logic. This signal enables the pixel counter to count.
PLATCH-0	A9-1;A9-6 A10-1;A10-6	Processor Latch. This latch is used to latch the pixel data into the processor read data latches.
POP8-0	A8-2;A8-1	POP the 8 bit counter value. This state controller signal loads the 8 bit counter with the value contained in its buffer latch (the last value written by I/O).
POPX-0	A8-2;A8-4	POP X Axis value. This state controller signal loads the X axis register with the last value written by I/O.
PREADH-0	A9-6;A9-6 A10-6;A10-6 (internal to the schematic)	Processor Read Latch (high byte enable). A high will enable one of the three processor read latches.

Signal	Source; Destination	Explanation
PREADL-0	A9-6;A9-6 A10-6;A10-6 (internal to the schematic)	Processor Read Latch (low byte enable). A high will enable two of the three processor read latches.
PRQST-1	A8-5;A8-5 (internal to the schematic)	Pixel Request. A signal which requests a pixel write (this may or may not result in a PWRT-0 on the raster bus, depending on the operating mode of the index file).
PSYNC-1	A7A1-1;-----	Power supply sync pulse. (not used in the 4113)
PWRT-0	A8-5;A9-1 A10-1	Write pulse for the data and RAS addressable latch (see ALL-1).
PZERO-0	A8-2;A8-5	Pipelined Zero. This signal is the zero count signal from the 12 bit counter delayed one clock cycle.
Q19-1 thru Q0-1	A9-5,6;A9-3 A10-5,6;A10-3	Outputs of video shift registers and memory array. Acts as 20 bits of RAM output data.
QC-1	A9-6;A9-6 A10-6;A10-6 (internal to the schematic)	Video output of the shift register.

Signal	Source; Destination	Explanation
QS0-1 and QS1-1	A2A1-1;J104	Queue Status 0 and 1. QS0-1 and QS1-1 are direct outputs of the microprocessor that are not used on the Processor board.
QUAL-0	A8-2;A8-2 (internal to the schematic)	A state controller signal that serves as a scope or logic analyzer trigger.
R19-1 thru R0-1	A9-4,6;A9-2 A10-4,6;A10-2	R19-1 thru R0-1 on the Raster Memory boards has the same function as Q19-1 thru Q0-1 (acts as 20 bits of RAM output data).
RA0-1 thru RA6-1	A4A1-1;A4A1-3, A5-1 A6-1;A6-2,A5-1	RAM Address bits 0 through 6. These signals contain the seven multiplex row and column addresses from the dynamic RAM controller to the dynamic RAMs on the RAM Array board.
RAS-0	A4A1-1; A4A1-3;A5-1	Row Address Strobe. RAS-0 is generated by the Dynamic RAM Controller on the RAM/ROM board. RAS-0 strobes the seven multiplexed row address bits appearing on RA0-1 thru RA6-1 into the RAMs on the RAM Array board.

Signal	Source; Destination	Explanation
RAS-1	A7A1-2;A9-1, A10-1	Row Address Strobe. RAS-1 originates in the RAM timing generator and is used to strobe the RAMs.
RAS0-0 thru RAS19-0	A9-1;A9-4,5 A10-1;A10-4,5	Row Address Strobe. Strobe for the dynamic RAMs.
RAS0-0 thru RAS3-0	A6-1;A6-2	Row Address Strobe 0 through 3. These signals are generated by the Dynamic RAM Controller on the RAM Controller board. RAS0-0 thru RAS3-0 strobe the seven multiplexed row address bits appearing on RA0-1 thru RA6-1 into the RAMs on the appropriate RAM Array board (RAM Bank 0 through 3).
RCLK-1	P102;A2A1-5	Receive Clock. RCLK-1 is an RS-232 external clock signal generated by a modem or other external device. RCLK-1 can be used to clock data into the Processor board's UART.

Signal	Source; Destination	Explanation
RD-0	A2A1-1; A2A1-2,4,5	Read. If RD-0 is low, it indicates the microprocessor is performing an IO or memory read cycle, either to the local or system bus.
RDATA-1	P102;A2A1-5	Received Data. RDATA-1 is the RS-232 serial data input from a modem or other external device to the Processor board.
RDIS-0	J357;A8-2	ROM Disable RDIS-0 is a square pin test signal on J357-4. When RDIS-0 is tied low, the outputs of the microcode ROMs will be tristated.
RDY-1	J104;A2A1-1	Ready. RDY-1 is the 8086 microprocessor RDY signal output to test connector J104.
RDYAND-0	J104;A2A1-1	Ready And. RDYAND-0 is an input from a test device connected to J104 that can disable the RDY line to the MPU, causing the MPU to enter a WAIT state.

Signal	Source; Destination	Explanation
RDYOR-0	J104;A2A1-1	Ready Or. RDYOR-0 is an input from a test device connected to J104 that can activate the RDY line to the MPU, causing the MPU to exit a WAIT state.
REDSYNC-0	A11-2;A11-3	REDSYNC-0 is a composite sync signal. This signal is used by the Red Dac section on the Color Map board to synchronize to the Blue and Green Dac sections.
REF-0	A7A1-2;A9-1, A10-1	Indicates that a screen refresh memory cycle is taking place.
RENB-0	A7A1-2;A7A1-3	Enable signal for screen refresh memory buffer.
RESET-0	A7A1-3; A7A1-1,4 J357;A8-1	Logic reset pulse. RESET-0 is generated when INIT-0 is received from the 8086 bus. RESET-0 also appears on J357-5 and can be used to reset the logic on the Vector Generator board.
RING-1	P102;A2A1-5	RING-1 is an RS-232 status input indicating that an auto-answering modem is ringing.

Signal	Source; Destination	Explanation
ROUTEN-0	A4A1-1;A4A1-3	ROUTEN-0 enables the ROM Data I/O drivers in the Data I/O Drivers section of the RAM/ROM board.
RQ-0/GT[0/1]-0	A2A1-1;J104	Request/Grant. RQ/GT0 is the local MPU bus request/grant signal. It is available to J104 test connector, but is not used on-board.
RSEL11-0 thru RSEL0-0	A4A1-1;A4A1-2	These are twelve separate lines that enable one of the 12 banks of ROM on the RAM/ROM board.
RST-0	A2A1-1;A2A1-2, 4,5	Reset. RST-0 is RST-1 inverted (see RST-1).
RST-1	A2A1-1;A2A1-5	Reset. RST is derived from the system bus signal INIT-0 and is synchronized to the MPU clock. RST resets the MPU and other devices on the Processor board.
RTS-1	A2A1-5;P102	Request To Send. RTS-1 is an RS-232 signal generated by the RS232 Communications Interface block on the Processor board.

Signal	Source; Destination	Explanation
S0-0 thru S2-0	A2A1-1;A2A1-2	Status 0 through 2. These status lines have eight states taken together and indicate whether an interrupt acknowledge read IO, write IO, halt, code access, read memory, or write memory is occurring. The bus controller IC in the Bus Command Driver block interprets the S0-0, S1-0, and S2-0 signals and outputs INTA, IOWC, AIOWC, IORC, MRDC, MWTC, AMWC accordingly.
S7-1/BHE-0	A2A1-1;A2A1-2	Status 7/Byte High Enable. This signal is interpreted as BHE-0 during the MPU state T1. It enables D8--D15 onto the local data bus. During T2, T3, or T4 this signal is interpreted as S7-1.
SACK-0	A8-1;A7A1-1, A11-1	Synchronized system acknowledge. SACK-0 originates at the Vector Generator board and is used to syncronize the IO writes from the 8086 to the Vector Generator state machine and the Color Map board.

Signal	Source; Destination	Explanation
SCANSYNC-1	A7A1-2;P281	Scan sync pulse. SCANSYNC-1 originates in the Pixel timing block and is used on the External Video board to syncronize the horizontal scanning of the External Video board with the Video Controller.
SDCD-1	P102;A2A1-5	Secondary Data Carrier Detect. SDCD-1 is the RS-232 secondary data carrier detect signal.
SENSE-1	A8-2;A8-2 (internal to the schematic)	A state controller signal that controls the sense (inversion) of the selected test condition.
SHIFTENB-0	A8-5;A8-5 (internal to the schematic)	Shift Enable. Output of the counter control logic. This signal enables the pattern shift registers to rotate.
SINIT-0	A8-1;A8-2	System initialize. Reset for the state sequencer. This is the logical "OR" of the (1) bus reset (RESET-0) and (2) software reset (I/O write to address F71E) signals.

Signal	Source; Destination	Explanation
SLOW-0	A7A1-3;A7A1-2	Causes the DCRY-1 signal to go at one half the normal rate (for external scan time during vertical sync).
SR1READ-0	A8-1;A8-5	Decoded read strobe for shift register 1 (at address F710).
SR2READ-0	A8-1;A8-5	Decoded read strobe for shift register 2 (at address F712).
SRTSA-1	A2A1-5;P102	Secondary Request To Send (RS-232A). SRTSA-1 is the RS-232A secondary request to send output. SRTS is defined on a different connector pin for RS-232C, and so is strappable on the board.
SRTSC-1	A2A1-5;P102	Secondary Request To Send (RS-232C). SRTSC-1 is the RS-232C counterpart to SRTSA-1 above.
STATEN-0	A2A1-5;A2A1-1	Status Enable. STATEN-0 is low during an MPU read of status at IO location X'00ED' or X'00EF'.

Signal	Source; Destination	Explanation
STEST-0	Self Test Switch;A2A1-5, A7A1-3,A11-3	Self Test. STEST-0 is a line on the system bus which the Processor can read via a 3-state driver. The line is low when the self-test button is pressed.
T3W4-1	A2A1-1;A2A1-3	(state) T3, Wait, 4. T3W4-1 is high when the MPU is in a T3, T4, or TW (WAIT) state. T3W4-1 enables on-board data transceivers.
T4I-0	A2A1-1;A2A1-3	(State) T4, Idle. T4I-0 is low during MPU T4 and TI (idle) states. It turns off data transceivers during T4 in on-board memory and IO READs.
TBLANK-0	A7A1-3;A7A1-2, A11-3	TTL level composite blank. TBLANK-0 is used by the Blanking control on the Color Map board.
TCLK-1	P102;A2A1-5	Transmit Clock. TCLK-1 is the RS-232 transmit clock output from the Processor board.

Signal	Source; Destination	Explanation
TDATA-1	A2A1-5;P102	Transmitted Data. TDATA-1 is the RS-232 signal on which serial data is transmitted from the Processor board.
TEQ-1	A8-2;A8-2 (Internal to the schematic)	Test Equal. A state controller signal that allows the EQUAL-1 signal from the raster bus to be tested by the state controller (used by the video memory test).
TEST-0	J104;A2A1-1	TEST-0 is an input to the MPU. It is available at pin 50 on the test connector, but is not used on-board (see second definition).
TEST-0	A7A1-1;A8-5, A9-1,A10-1	TEST-0 puts the Raster Memory boards into test mode.

Signal	Source; Destination	Explanation
TEST-1	A2A1-5;A2A1-1	TEST-1 is a signal that the processor can set to enable the Clock Generator to locally terminate an on-board or off-board READ or WRITE operation. The signal is used for testing purposes, and is similar in function to the Bus Timout Detector circuit.
TESTCONDITION-1	A8-2;A8-2 (internal to the schematic)	The output of the test condition mux, test gate, and delay flip-flop that acts as an input to the micro-opcode decode ROM. This signal allows conditional opcodes to "make a choice" between two actions.
TF1-0 & TF2-0	A8-5;A8-2	Test Flags 1 & 2. Two general purpose flags from the high byte of the index file register. These signals are used by the 8086 to direct the vector generator during some routines. These flags can be tested by the state controller.

Signal	Source; Destination	Explanation
TIMERINT-0	A2A1-5;A2A1-2	Timer Interrupt. TIMERINT-0 indicates the presence of either a Programmable Interval timer1 interrupt, a UART TXEMT interrupt, a UART TXRDY interrupt, an RS-232 status change interrupt, or an Programmable Interval TIMER0 interrupt (via RSCD).
TIMR1-1	A2A1-5;A2A1-1	Timer 1. This signal is output from the O1 output (pin 13) of the Programmable Interval Timer. O1 is the output of a 16-bit programmable down counter.
TXC-0	A2A1-5;P102	Transmit Clock. TXC is the buffered output of the Programmable Interval timer1 to the RS-232 connector. It is not presently used.
UBCLK-1	A2A1-1; A2A1-4,5	Unbuffered Bus Clock. UBCLK-1 is a 4.9152 MHz square wave clock provided to clock the UART and peripheral interface microprocessor.

Signal	Source; Destination	Explanation
VACK-0	A7A1-2;A9-1, A10-1	Acknowledges that a memory cycle has been granted.
VBUSY-0	A8-2;A11-2	Vector Generator busy. (Not used by the 4113. Terminated on the Color Map board).
VCLK-0	A7A1-2;A8-3	Clock for the Vector Generator.
VDR1VE-0	A7A1-3;A11-2	Used by the Color Map board to generate the vertical sync signals. This signal is VSYNC-0 on the Video Controller board.
VENB-0	A7A1-2;A8-4, A9-1,A10-1	Enables the Vector Generator memory address buffers.
VENB-1	A9-1;A9-2,3 A10-1;A10-2,3	Vector Enable. VENB-1 is high when the RAM cycle is doing any type of vector generator function.
VGADR-0	A7A1-1;A8-1, A9-6,A10-6, A11-1	The decoded most significant five bits of the raster I/O Address.
VGRDY-1	P280;A7A1-1	Vector generator ready status signal.
VID3-1 thru VID0-1	A9-6,A10-6; A11-1	Raster Memory Planes data input lines (used by the Color Map board). Strappable on the Raster Memory Plane boards.

Signal	Source; Destination	Explanation
VIDEO	A7A1-4;P287	Not used by the 4113.
VRQST-0	A8-5;A7A1-2	Request from the Vector Generator to the Video Controller for a memory cycle.
VSYNC-0	A7A1-3;A7A1-1, A11-2	Vertical synchronizing signal.
VTIME-0	A7A1-1;A7A1-4	Vertical retrace time.
W1-0 thru W4-0	A9-1;A9-4,5 A10-1;A10-4,5	Write pulse for RAMs.
WAIT-1	A8-2;A8-1	This state controller signal can delay the syncing of the the write pulse. If the write pulse is delayed by WAIT-1 this delays SACK-0, thereby delaying the acknowledge to the 8086. This operation can allow the Vector Generator to sync the 8086 to the Vector Generator operation.
WALU0-0	A9-4;A9-1,2 A10-6;A10-1,2,3	A clock pulse that latches the ALU mode latch and the write enable latch.
WBORDER-0	A9-6;A9-6 A10-6;A10-6 (Internal to the schematic)	Write Border Latch. Output of I/O Decode section. This signal acts as a clock for the flipflop of the video shift register.

Signal	Source; Destination	Explanation
WELSB-0	A4A1-1; A4A1-3,A5-1 A6-1;A6-2,A5-1	Write Enable Least Significant Byte. WELSB-0 is a control strobe to the RAM Array board indicating that a write operation to the least significant byte of RAM is in progress.
WEMSB-0	A4A1-1; A4A1-3,A5-1 A6-1;A6-2,A5-1	Write Enable Most Significant Byte. WEMSB is a control strobe to the RAM Array board indicating that a write operation to the most significant byte of RAM is in progress.
WENB-1	A9-1;A9-6 A10-1;A10-6	Write Enable status bit for Self Test. Output of flipflop in the RAM control section.
WR-1$\sim$	A7A1-2;A9-1, A10-1	WR-1 originates in the RAM timing generator and is the write enable signal for the RAMs.
WWENB-1	A9-1;A9-6 A10-1;A10-6	Write enable status bit for self test. Output of flipflop in the RAM control section. WWENB-1 is only used on the Dual Plane Raster Memory board and corresponds to WENB-1.
X19-1 thru X0-1	J402;A9-3, A10-3	Not currently used.

Signal	Source; Destination	Explanation
XACK-0	A4A1-1;A4A1-3 A6-1;A6-2	Transfer Acknowledge. The Dynamic RAM Controller generates XACK-0 to acknowledge that a RAM read or write operation is in progress. This signal latches the RAM output data into the data output latches.
XCARRY-0	A8-4;A8-5	Carry out of the X register.
XCLK-0	J290;A4A1-1 P166;A6-1	External Clock. When the clock circuitry is disabled using CLKDIS-0, an external TTL clock signal may be fed into XCLK to control the Dynamic RAM Controller (this is a test point for factory use only).
XCNTENB-0	A8-5;A8-1,4	X Counter Enable. This is a state controller signal that enables the X axis register to count and causes the first signal to go false.
XEN-0	A15- ;A7A1-3, A7A1-1,A11-2	External sync mode enable. From the External Video board to the Video Controller and Color Map boards. XEN-0 is tied high if there is no External Video board in place.

Signal	Source; Destination	Explanation
XENB-1	A8-3;A8-5	X Enable. The slope generator output that signifies that the X axis should be counted on the next cycle. This signal interfaces with the counter control logic.
XHSYNC-0	A15- ;A7A1-3	External horizontal sync. From the External Video board to syncronize the Video Controller's Horizontal sync to an external source. Tied high on the Color Map board if there is no External Video board installed.
XIN-1	A8-4;A8-5	A signal that means that the three most significant bits of the X axis register are zero. This signifies that the X position is in the physical screen.
XLD-0	A8-4;A8-1,5	X Load. This signal loads the X axis counter and Pixel counter with the value in the buffer latch (the last value written by I/O). It also sets FIRST-0 true.

Signal	Source; Destination	Explanation
XNEXT-0	A8-3;J350	Inverted XENB-1 signal (for test purposes).
XREAD-0	A8-1;A8-4,5	Decoded read strobe for the X axis register (at address F70C).
XSIGN-0	A8-3;A8-4,5	Signal from the axis control register which determines which direction the X counter will count.
XSIGN-1	A8-3;J350	Inverted version of XSIGN-0 (for test purposes).
XTRA-1	A5-1;none	Extra. XTRA-1 is an extra line of the RAM Array board that is currently not used.
XVSYNC-0	A15- ;A7A1-3	External vertical sync. From the External Video board to syncronize the Video Controller board's vertical sync to an external source. Tied high on the Color Map board if there is no External Video board installed.
Y19-1 thru Y0-1	P402;A9-2, A10-2	Not currently used.

Signal	Source; Destination	Explanation
Y-1/-0	A8-2;A8-4	This is a state sequencer signal that selects either the Y axis or delta Y axis to be sent to the raster bus.
YCNTENB-0	A8-5;A8-4	Y Counter Enable. Output of counter control logic which enables the Y axis register to count.
YENB-1	A8-3;A8-5	Y Enable. The slope generator output that signifies the Y axis should be counted on the next cycle.
YIN-0	A8-4;A8-5	A signal that means that the three most significant bits of the Y axis register are zero. This signifies that the Y position is in the physical screen.
YNEXT-0	A8-3;J350	Inverted YENB-1 signal (for test purposes).
YREAD-0	A8-1;A8-4	Decoded read strobe for the Y axis register (at address F70A).
ΔYREAD-0	A8-1;A8-4	Decoded read strobe for the delta Y axis register (at address F708).

Signal	Source; Destination	Explanation
YSIGN-0	A8-3;A8-4	Signal from the axis control register which determines which direction the Y and delta Y counters will count.
YSIGN-1	A8-3;J350	Inverted version of YSIGN-0 (for test purposes).
ZENB-0	A8-2;A8-5	Zero Enable. This state controller signal enables two zero detect signals (ZERO-0 and PZERO-0).
ZERO-0	A8-2;A8-5	This signal indicates the 12 bit counter is zero. Testable by the state controller and also used to end a vector through hardware.

Appendix C

STRAP INFORMATION SUMMARY

The terminal has straps on the various circuit boards, which provide flexibility in its operating parameters. There are two kinds of straps: cut straps and jumper straps. In cases where the terminal was designed to function one way but provisions were made for future design enhancements, cut straps are often used. Cut straps are also used for straps that are changed infrequently. Cut straps generally consist of a run on the circuit board that must be cut in order to open the strap. Cut straps can then be closed by creating a solder bridge over the open area. Jumper straps are changed much more often than cut straps. Most jumper straps only require changing a two or three pin connector to connect a different set of pins.

This summary gives the strap settings for each standard circuit board in the pedestal/desk of the terminal. For the straps existing in the display, consult the 4113 Display Module Service Manual.

PROCESSOR BOARD STRAPS

Several cut and jumper straps are provided on the Processor board. Straps labeled "Jxxx" have square pins with movable jumpers. Straps labeled "Wxxx" are cut straps; they consist of circuit traces on layer 1 of the ECB with no square pins. Table C-1 lists these strap settings. Figure C-1 shows the location of the Processor board straps.

Table C-1

PROCESSOR BOARD STRAP SETTINGS

Strap Label	Definition
ROM Logic Straps:	
ROM Size Strap (W126)	Selects either 16K bit or 32K bit ROMs, or disables all Processor board ROMs.
ROM Wait States (W475)	Normally strapped for ONE wait state. If all the ROMs on the Processor board are fast enough, this strap may be changed to indicate ZERO wait states.
ROM Type Straps (J226, J326, J426, J427)	There is one set of straps for each two-ROM bank of ROMs. These straps configure the board for the pin-out of the ROM being used.
BLCK Source: (W455, W456)	Normally strapped to "on-board." If more than one Processor board is used in the system, only one should be strapped to "on-board;" all others should be strapped to "off-board."
Interrupt Level Straps: (W470)	The Processor can generate three different interrupts to the 8086 bus. These straps define the interrupt priority levels of the three different interrupts. Normally, the "host port receiver interrupts" are set to interrupt level 0, "keyboard interrupts" set to level 4, and "host port transmitter" are set to interrupt level 5.

Table C-1 (cont)

PROCESSOR BOARD STRAP SETTINGS

Strap Label	Definition
Bus Timeout Enable: (W561)	Prevents the Processor board from driving ACK1-0 on a bus timeout. Used for multi-Processor board systems.
Test 1 and Test 2: (J150 and J125)	Tests 1 and 2 disable clocks on the Processor board for ATE (automated test equipment) testing.
RS-232C/RS-232A: (J522)	This is normally set for RS-232C. When restrapped for RS-232A, the SRTS (Secondary Request To Send) signal is sent to Pin 11 of the 25-pin RS-232 connector rather than to Pin 19.

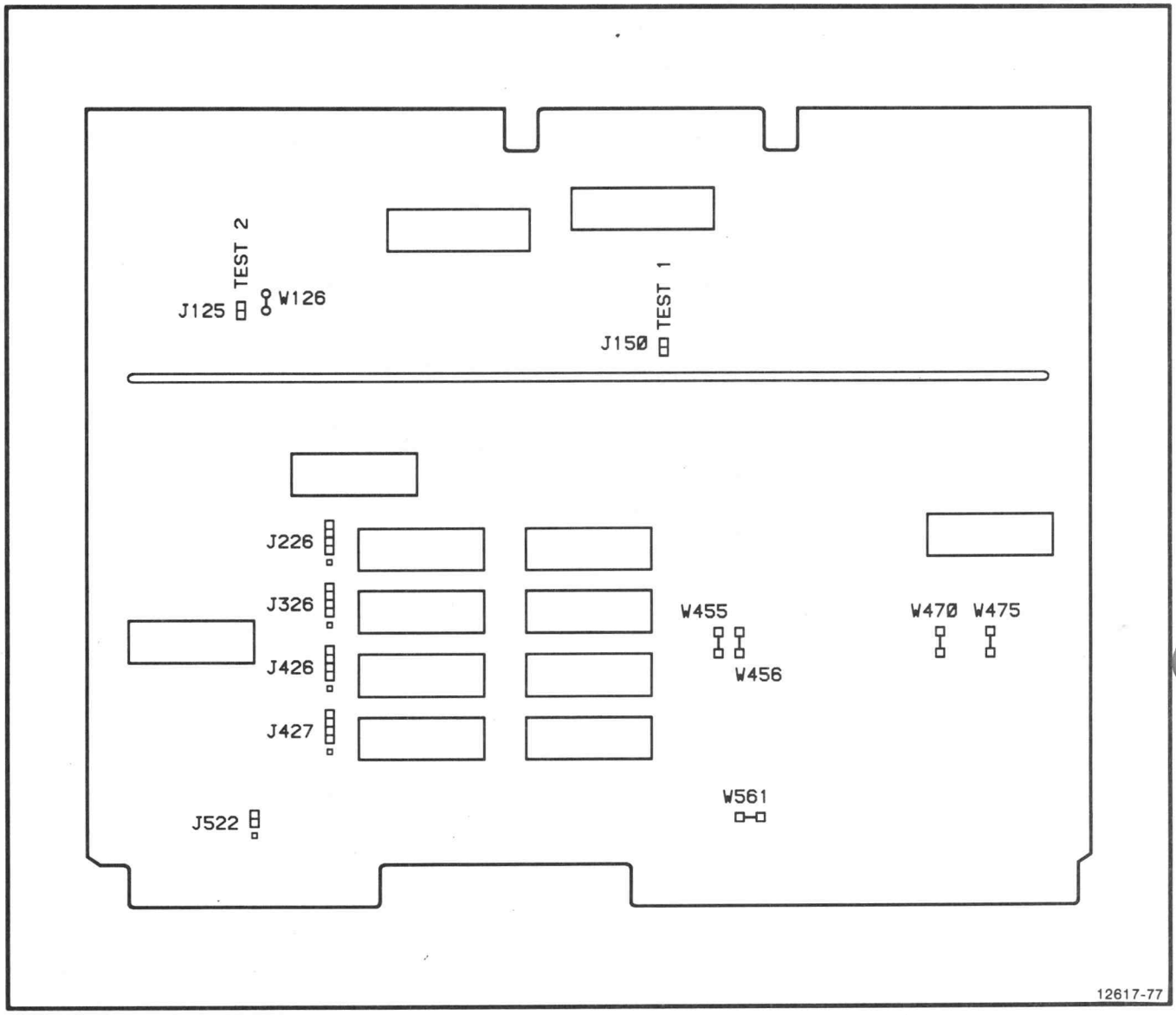

Figure C-1. Processor Board Strap Locations.

KEYBOARD STRAP

The keyboard has a set of cut straps that allows the firmware to interpret key strokes according to languages other than English. This strap consists of four individual cut straps labeled E1 through E4 on the circuit board. The combinations of these straps are read as one hexadecimal number which corresponds to certain keyboard options. See Table C-2.

Appendix E gives the full procedure for installing optional keyboards.

Table C-2

KEYBOARD LANGUAGE OPTION STRAPS

Language	Option Number	Open Cut Strap	Hex Code
Standard	--	none	00
United Kingdom	4A	E4	08
Swedish	4C	E2	02
APL	4E	E1	01
Danish/Norwegian	4F	E2 & E3	06

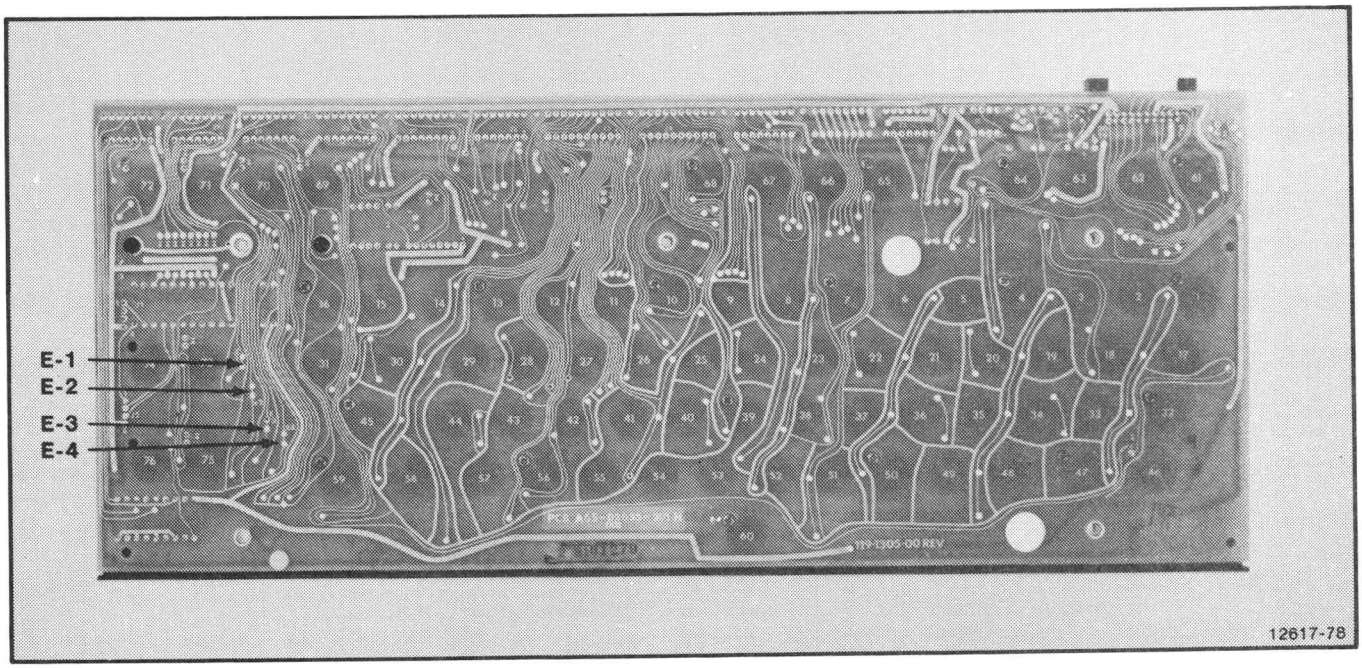

Figure C-2. Keyboard Strap Locations.

RAM/ROM BOARD STRAPS

The RAM/ROM board has a variety of jumper straps to allow for the installation of different manufacturers ROMs. There are also four straps that are used to disable parts of the board for factory testing. These straps are not installed in the terminal. The straps for the RAM/ROM board are labeled "Jxxx" on the circuit board. Table C-3 is a summary of the straps.

Table C-3

RAM/ROM BOARD STRAP SETTINGS

Strap Label	Setting	Definition
J111, J121, J131, J141, J151, J161, J171, J181, J184, J187, J190, J193	Installed	These straps are located beneath the twelve banks of ROM on the circuit board. These straps may be set to accept a number of different ROMs from different manufacturers. The setting for the straps are listed on the RAM/ROM board schematic (A4A1-2) and depend on the types of ROMs installed.
CLKDIS/XCLK J290	No strap installed.	There is normally no strap installed. For test purposes, however, a strap may be set to the CLKDIS position, disabling the 20.008 MHz clock. An external clock may then be applied to the remaining pin. With no strap on the pins, the clock operates in its normal manner. This strap is used for test purposes only, IT SHOULD NOT BE INSTALLED FOR NORMAL USE.

Table C-3 (cont)

RAM/ROM BOARD STRAP SETTINGS

Strap Label	Setting	Definition
RD/IN J360	RD	The RD/IN strap is used to permanently enable the ROM Address Decoders (IN position) or allow the read decoders to be enabled only upon receiving a MRDC-0 pulse (RD position). This strap is normally set to the RD position.
ACK1/ACK2 J365	ACK2	This strap will allow the ACK2 signal to be generated when placed in the ACK2 position. When placed in the ACK1 position, the ACK1 signal will be generated. This strap is normally placed in the ACK2 position.
J370, J375, J470	No straps installed.	These three straps are ROMDIS1, ROMDIS2, and RAMDIS. These straps, when installed, will disable the RAM and ROM Address Decode sections of the circuit board. THESE STRAPS ARE NOT INSTALLLED FOR NORMAL OPERATION.

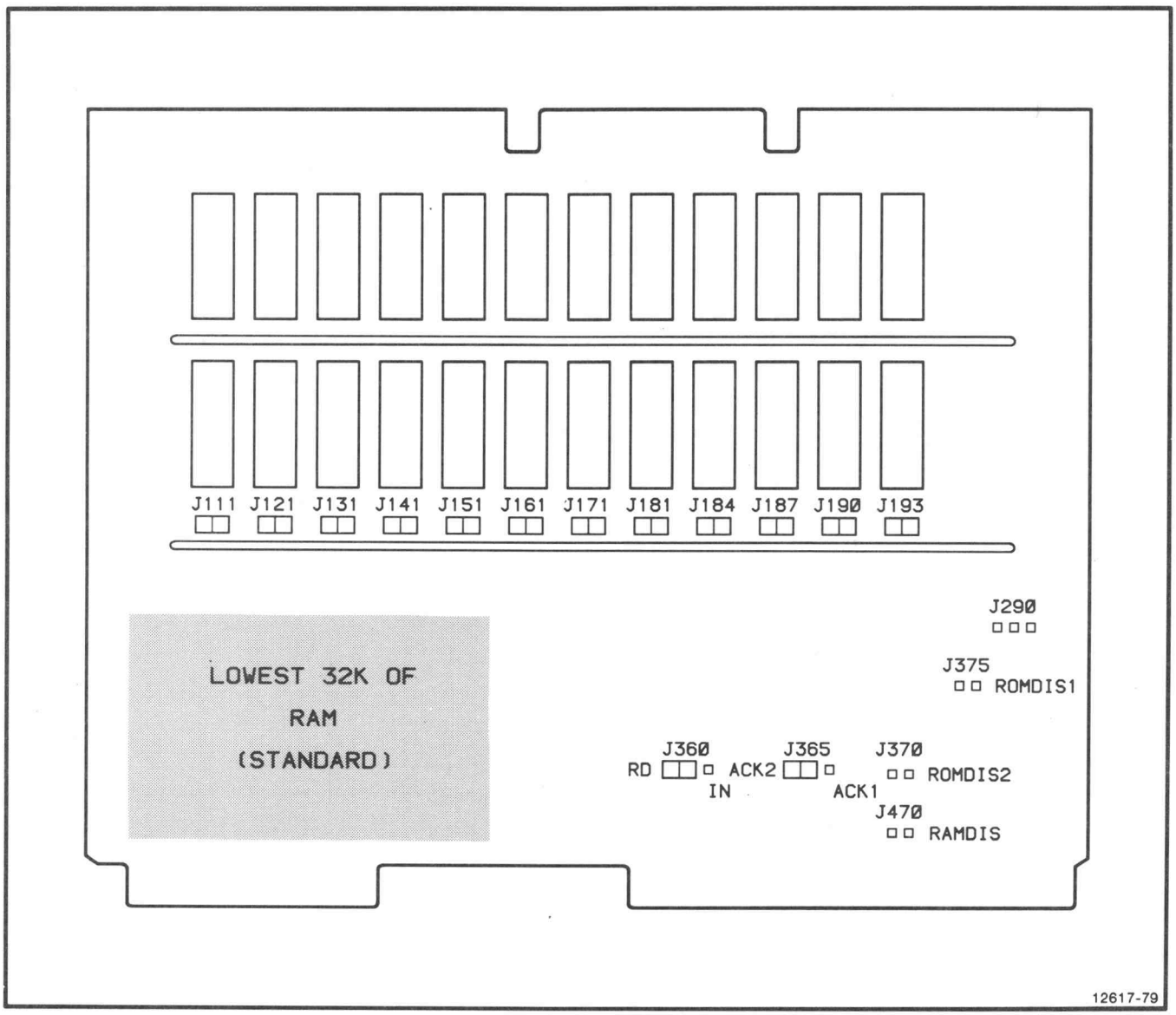

Figure C-3. RAM/ROM Board Strap Locations.

RAM CONTROLLER BOARD STRAPS

To install optional RAM memory, one or more RAM Controller boards must be installed in the card-cage. Each RAM Controller board has sockets for four RAM Array boards. The RAM Array boards contain 32K-byte banks of memory. Since six RAM Controller boards can be installed in the terminal, it is necessary to specify the starting address of the four RAM banks on each RAM Controller board.

Strap J165 sets the Base Address for all memory on the board. Set the strap to "1," for the RAM Controller board nearest the Processor board. Set the strap on the other RAM Controller boards to "2", "3", "4", etc., as they are placed in order farther away from the Processor board. Strap J165 allows strapping for a maximum of six RAM Controller boards. See figure C-4.

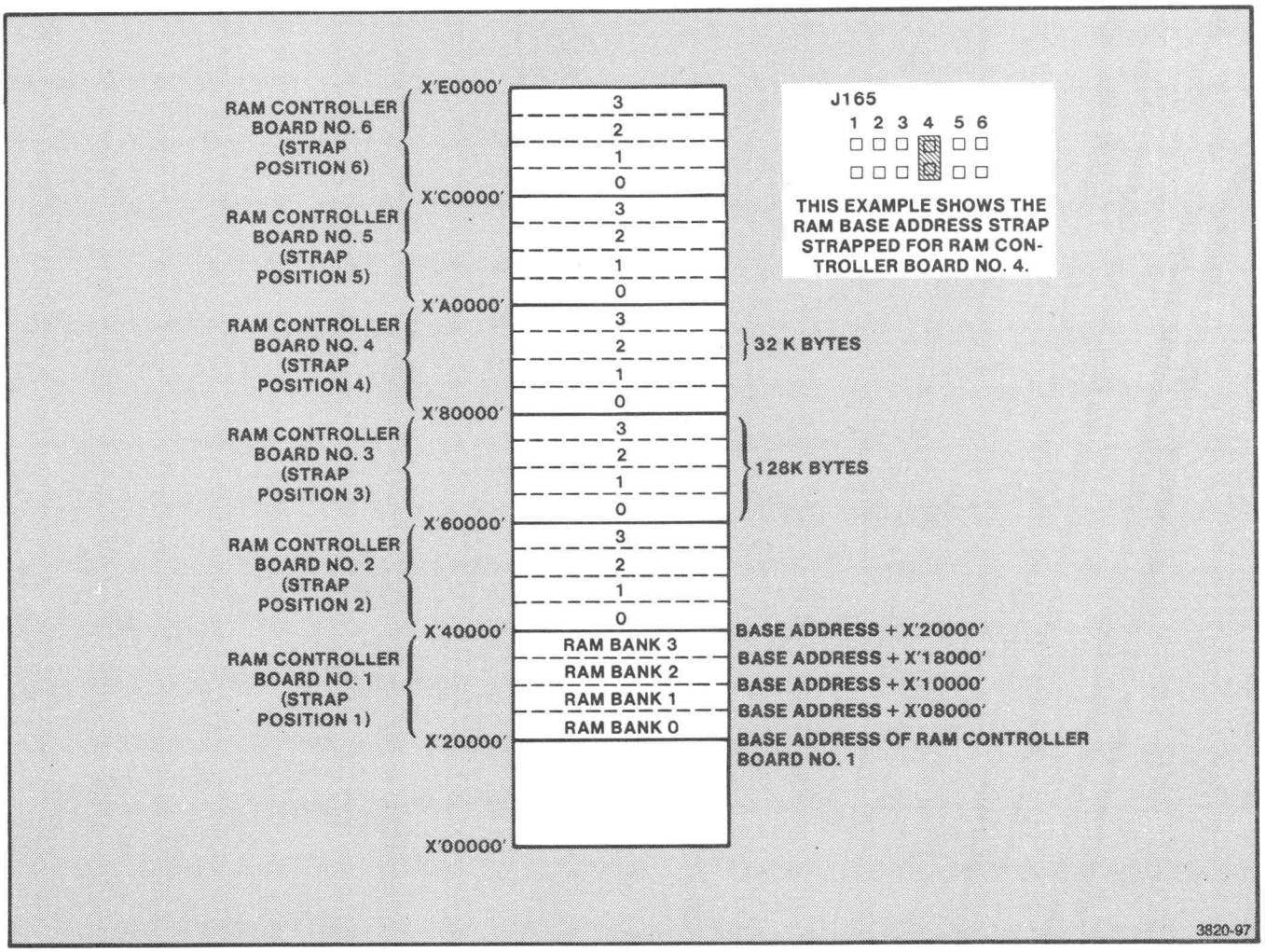

Figure C-4. Strapping RAM Controller Board Base Address.

VIDEO CONTROLLER BOARD

There are six straps that need to be installed on the Video Controller board. These straps do not have positions, and can only be installed or not installed. These straps are J55, J56, J201, J361, J563, and J650. Not having these straps installed will cause an open connection and the terminal will not operate properly. J501 is also a two pin connector, but should not have a strap installed. Table C-4 shows strap settings that have two positions for the Video Controller board. Figure C-5 Shows the Strap locations.

Table C-4

VIDEO CONTROLLER BOARD STRAPS

Strap	Setting	Function
J551	RIGHT	Generates 60 Hz 525 line video when set to the right. Generates 50 Hz 625 line video when set to the left.
J310	UP	Generates timing for 2118 type RAMs when set to the UP position. Generates timing for 4116 type RAMs when set to the DOWN position.

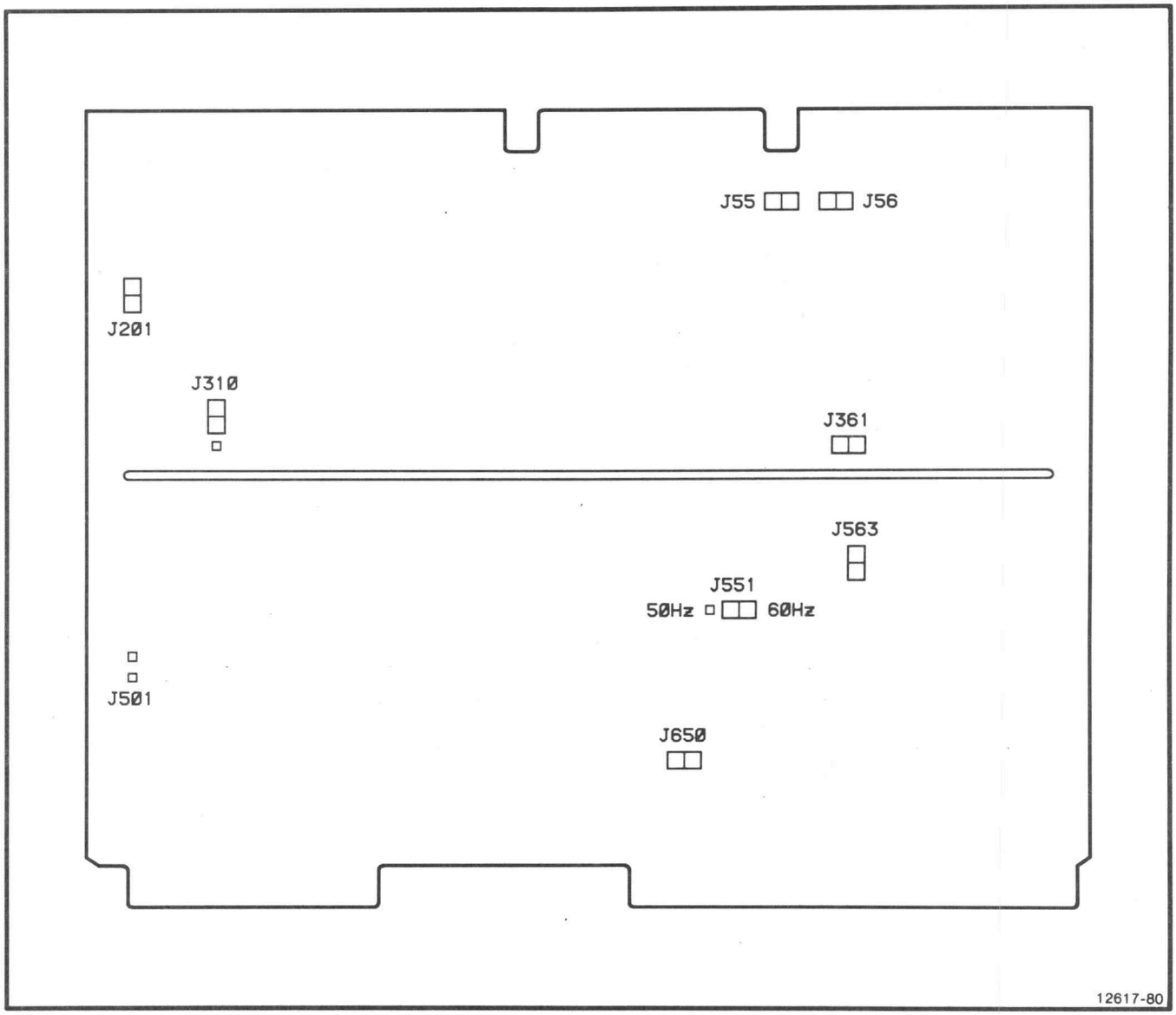

Figure C-5. Video Controller Board Strap Locations.

VECTOR GENERATOR BOARD STRAPS

Strap W190 may be opened to restrict microcode address space to 256 words when 74S471-type ROMs are used (74S372 type ROMs are currently used). This is the only strap on the Vector Generator board.

RASTER MEMORY BOARD STRAPS

Both the Single and Dual Plane Raster Memory boards have the same straps with the same Jxxx numbers. Although the straps are the same, they are set different for each board. If a second Dual Plane Raster Memory board is installed, the strap settings on this board will be different that on the first Dual Plane board. Table C-5 shows the strap settings for a Dual Plane Raster Memory board, a Single Plane Raster Memory board, and a second Dual Plane Raster Memory board.

NOTE

When a second Dual Plane board is installed (increasing the number of bit/planes from 3 to 4), this replaces the Single Plane board. There should never be more than two Raster Memory boards installed in the terminal.

Figure C-6 shows the location of the straps for the Raster Memory boards.

Table C-5

RASTER MEMORY BOARD STRAPS

Strap Label	Dual Plane Board	Single Plane Board	Second Dual Plane Board	Definition
VID2-1/VID0-1 J717	VID0-1	VID2-1	VID2-1	This strap allows the Raster Memory board data to be sent to the Color Map board via the VID2-1 or VID0-1 line.
VID3-1/VID1-1 J718	VID1-1	No Strap Installed	VID3-1	This strap allows the Raster Memory board data to be sent to the Color Map board via the VID3-1 or VID1-1 line.
J679	Between pins 2 and 3 (ADR4-1 inverted)	Between pins 2 and 3 (ADR4-1 inverted)	Between pins 2 and 3 (ADR4-1 inverted)	This strap is used to invert the ADR4-1 line for use by the I/O decode section.
J680	Between pins 1 and 2 (ADR3-1 noninverted)	Between pins 2 and 3 (ADR3-1 inverted)	Between pins 2 and 3 (ADR3-1 inverted)	This strap is used to invert or not invert the ADR3-1 line for use by the I/O Decode section.
PDAT2-0/ PDAT0-1 J707	PDAT0-0	PDAT2-0	PDAT2-0	This strap is used to determine which PDAT line is to be used by the Vector Data Input section.
PDAT3-0/ PDAT1-0 J708	PDAT1-0	No strap installed	PDAT3-0	This jumper is used to determine which PDAT line is to be used by the Vector Data Input section.

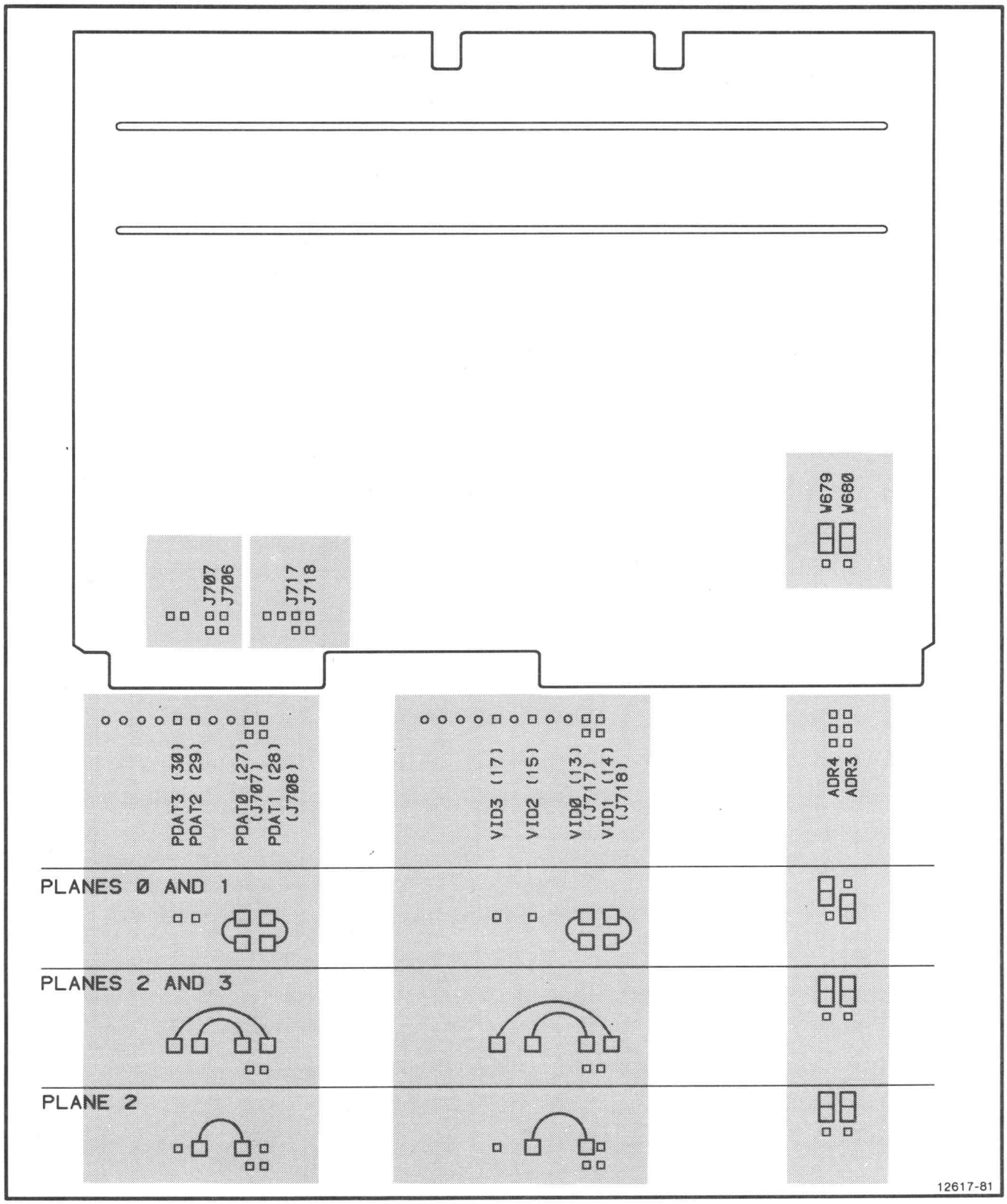

Figure C-6. Raster Memory Board Straps.

COLOR MAP BOARD STRAPS

There are only two straps on the Color Map board. J507 is a cut strap. J505 is a jumper strap. Figure C-7 shows the location of these straps.

1. J505 is strapped to the EXTSYNC-0 position. This will make both EXTVSYNC and EXTHSYNC true when they are low.

2. J507 is a cut strap set to the MONSYNC-0 position. This will make both MONVSYNC and MONHSYNC true when they are low.

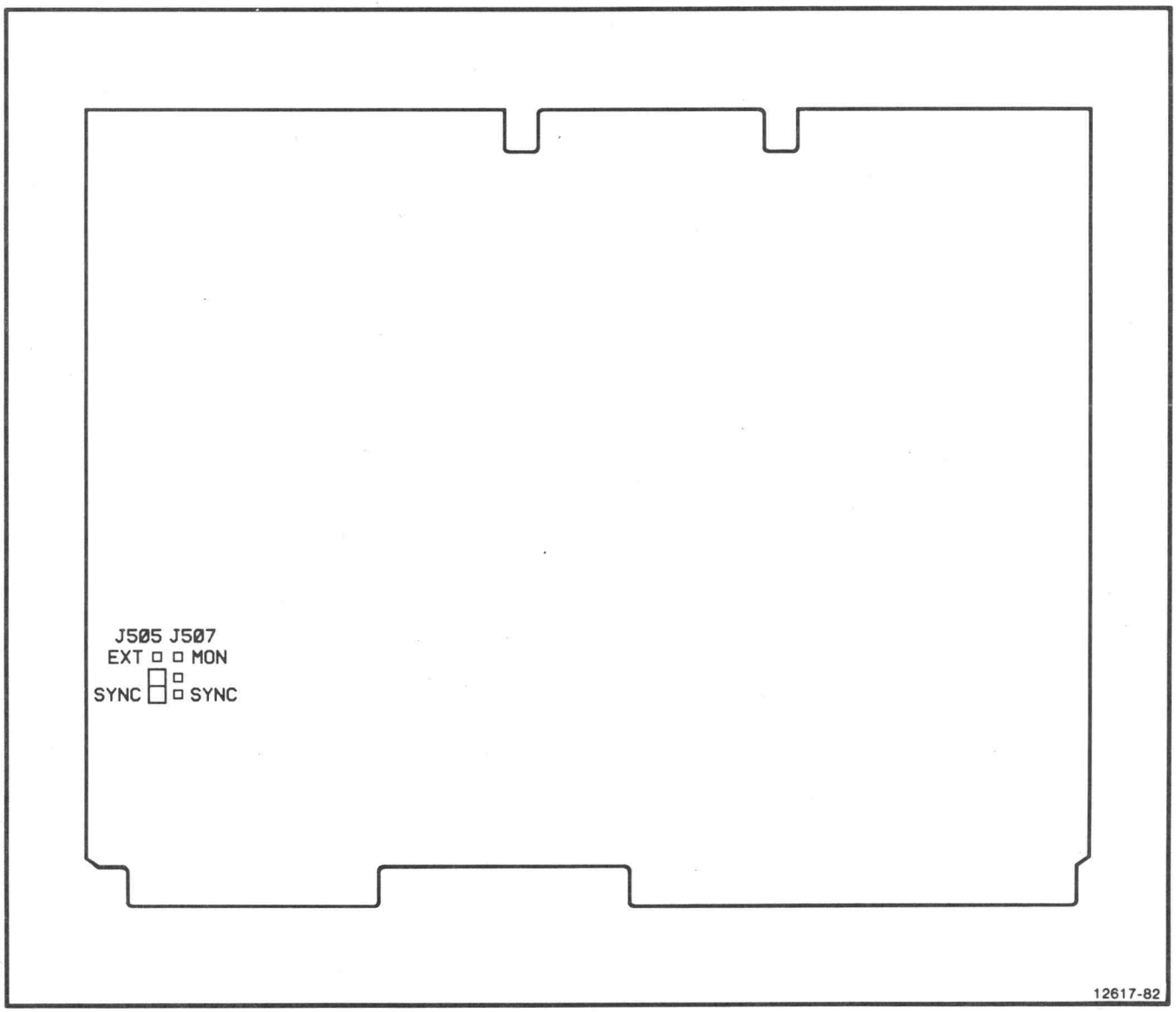

Figure C-7. Color Map Board Straps.

Appendix D

SELF TEST DIAGNOSTIC PROGRAM

INTRODUCTION

The primary trouble shooting aid for the 4113 is the Self Test diagnostic program. This program resides in firmware and is arranged so it checks all of the major hardware in the pedestal/desk. The program also generates visual patterns for testing and adjusting of the display module. If options are installed in the terminal, Self Test will test them, too. In all versions of Self Test, the first thing that is tested is the primary error reporting mechanism (keyboard LEDs). Self Test does not depend on any portion of the hardware until it has tested it; it may then use such hardware to aid in other tests. There are three types of Self Test used by the terminal. These are the Power Up sequence, the main Self Test program (referred to as Self Test in the text), and Adjustment Self Test.

The Power Up sequence is a subset of Self Test. The Power Up sequence performs only part of the full Self Test routine necessary to insure that the terminal will function. The Power Up sequence runs automatically everytime the terminal is turned on, and performs a quick check of the various hardware modules. If a fatal or major error is detected at this point, an error message advises the user. A fatal error will not allow the terminal to function. A major error is when a Set Up default [cmos] parameter fails and is mapped out of the system (this means the terminal will ignore that parameter). A major error still allows the terminal to run. Both types of errors are reported via either the keyboard LEDs or a message on the screen. The 4113 Operator's Manual and this appendix describes the error messages that may appear during the Power-Up sequence. For a detailed diagnostic examination of terminal hardware, use Self Test.

Self Test performs additional tests as well as repeating the same tests that were done during the Power Up sequence. Self Test can test the terminal to circuit board and circuit block levels. In some cases, Self Test will pinpoint the bad component or memory address, allowing for quick repair of the terminal. The details of Self Test are discussed later in this section.

While Self Test runs a specific all-points check program, Adjustment Self Test is used when the terminal is to be adjusted or a specific characteristic is to be checked. Adjustment Self Test will also restore the CMOS factory default parameters. Adjustment Self Test requires that the technician select the function that is to be tested or adjusted by pressing a specific key or combination of keys. Some of the things that Adjustment Self Test will do to aid in adjusting the terminal are: generate specific patterns needed for adjusting the display module or perform certain tests used for other adjustments. For instance, if Options 42 or 43 is installed (disk drives), Adjustment Self Test will do the necessary head movements for head alignment of the drive. It will will also give a hexidecimal code of any of the keys pressed (both downstrokes and upstrokes) allowing for pinpointing of a bad key or component. Adjustment Self Test will perform many other tests and checks, which are discussed later in this section. Like Self Test, Adjustment Self Test allows for the testing of options.

The remainder of this appendix is divided into two sections, Self Test and Adjustment Self Test. The Self Test section includes tables and figures that show the sequence of the tests performed, as well as what the error codes mean, and the problems they suggest. Since Self Test repeats all the tests done during the Power Up sequence, the Power Up sequence is covered in the first (Self Test) section. The Adjustment Self Test section shows the tests and patterns available, as well as the control guidelines for using Adjustment Self Test.

SELF TEST

Self Test is a firmware program (stored in ROMs) which tests the circuitry in the pedestal/desk. Self Test systematically checks each block of circuitry before using it to test other circuitry. Table D-1 and Figure D-1 (a foldout following the appendices) shows the order in which the tests are run. Figure D-1 is a graphic representation of Table D-1 with each normal process box in the flow chart representing one of the tests listed in the Table. As each specific test is run, the light code for that test will remain on the eight LEDs until the test is finished. If an error is found by the test, that code may "hang" on the LEDs while at the same time being accompanied by one or more keyboard bells (in the case of some non-fatal errors, the program will print a message on the screen and continue.

If the light code "hangs" on the keyboard LEDs, the code should then be read as a two-digit hexidecimal number. The code can then be looked up in one of the tables in this section to find out what test the terminal failed. The tables may request that a submessage be read. A submessage acts to narrow down the problem to a more specific cause. Submessages are usually obtained by pressing RETURN and reading the submessage as the next set of lights. With some error codes, there may be up to three levels of submessages to be read. This many submessages usually pinpoints the problem down to an exact component. After the display electronics (Vector Generator, Video Controller, Raster Memory, and Color Map boards) have been checked, submessages are displayed on the screen. Table D-1 does not show where the submessages occur as does Figure D-1.

In the following table, the diagnostic checks that are performed during the power up routine are marked by the letters PUP. This table only contains the tests executed by a standard terminal (no options installed, excluding extended RAM options). The firmware used to check the options are contained on those optional boards (such as the Disk Controller, Tablet Controller, or 3PPI board).

NOTE

The most lengthy test in the Self Test program is the Delay Memory Check. During this check, data is loaded into the RAMs, held for 14 seconds, and then rechecked. This is done for each 32K of RAM that is installed. On a fully optioned 4113, this test may take up to 4 minutes to run. During this time, the light code for the test (BB) remains displayed on the keyboard LEDs. THIS DOES NOT INDICATE AN ERROR. If there is an error in this test, the keyboard bell will ring twice, prompting the user to press return. This lengthy test can be ommitted from Self Test by pressing CONTROL D at the start of the keyboard key check.

Table D-1

POWER UP/SELF TEST SEQUENCE

Error Code Hex	Error Code Binary	Explanation	When Executed
FE	1111 1110	Light checking routine (beginning)	SLF
FD	1111 1101	Light checking routine (end)	SLF
FC	1111 1100	Keyboard key check	SLF
EF	1110 1111	Timer check	SLF/PUP
EE	1110 1110	Timer set up routine	SLF/PUP
EC	1110 1100	Standard system ROM check	SLF/PUP
DF	1101 1111	Standard RAM/Bus address check	SLF/PUP
BF	1011 1111	Standard 32K RAM Walking ones check	SLF
BB	1011 1011	Standard 32K RAM memory delay check	SLF
BE	1011 1110	Standard 32K RAM Walking zeros check	SLF
BD	1011 1101	Standard 32K RAM all ones check	SLF/PUP
BC	1011 1100	Standard 32K RAM all zeros check	SLF/PUP
B5	1011 0101	RAM stack building	SLF/PUP
BA	1011 1010	RAM/ROM memory tables building	SLF/PUP
DE	1101 1110	High address bus check	SLF/PUP
B9	1011 1001	Optional RAM walking ones check	SLF
BB	1011 1011	Optional RAM memory delay check	SLF

Table D-1 (cont.)

Error Code Hex	Error Code Binary	Explanation	When Executed
B8	1011 1000	Optional RAM walking zeros check	SLF
B7	1011 0111	Optional RAM all ones check	SLF/PUP
B6	1011 0110	Optional RAM all zeros check	SLF/PUP
B4	1011 0100	System vector table expansion	SLF/PUP
CE	1100 1110	Processor ROM check	SLF/PUP
8F	1000 1111	Video Controller test	SLF/PUP
8E	1000 1110	Raster memory test	SLF
8D	1000 1101	Vector Generator test	SLF/PUP
8C	1000 1100	Raster memory address test	SLF/PUP
8A	1000 1010	Color Map test	SLF/PUP
AF	1010 1111	CMOS and ROM to RAM load	SLF/PUP
FA	1111 1010	Keyboard identification set	SLF/PUP
EB	1110 1011	Interrupt check	SLF/PUP
DD	1101 1101	Host port register check	SLF/PUP
DC	1101 1100	Host port baud/character check	SLF
CD	1100 1101	ROM position check	SLF/PUP
CC	1100 1100	ROM version compatibility check	SLF/PUP

SLF means the test is performed during Self Test.
PUP means the test is performed during the Power Up routine.

Starting Self Test

During this discussion, it may be helpful to refer to the control flow flowchart, Figure D-1.

Start Self Test running by pressing the MASTER RESET and SELF TEST buttons. Press and hold MASTER RESET and SELF TEST (at the same time), then release the MASTER RESET button. After the Keyboard LEDs begin to "cycle", release the SELF TEST button.

The first test (LED light check) begins by turning on all the keyboard lights ("CAPS" key, four function LEDs, four indicator LEDs, and the "ZOOM" and "PAN" key LEDs) and then turning them off. The Keyboard lights then are each turned on and off in succession in a ripple pattern beginning with the right hand keys and going towards the most lefthand light. This cycling of the lights occurs twice, the first time slow, the second time fast. After the second cycle of the lights, the light check is completed. The object of the light check is to let the technician know that each light is working. If a light is not working, the error codes might not be reported properly (that digit in the code will not be functional). If an error occurs at this point, the Self Test program does not stop here but continues into the Keyboard keys test. A non-working light likely indicates a Keyboard or Processor board problem.

The Keyboard keys test is the second test that occurs (at the end of the LED light check). At the beginning of this test, the terminal rings the bell once, and the CAPS key light starts blinking. This prompts a user to press a key (any key) after waiting a few seconds. When the bell rings and the CAPs key blinks, the test is susposed to stop and wait for a keystroke. If the test proceeds without pressing a key, this means that spurious keystrokes are being generated. This type of problem could be caused by dirt or corrosion in the Keyboard, or a poor connection in the Keyboard-to-Processor board ribbon cable. If the test waits for a key entry, then press a key, allowing the tests to continue. If you wait too long before pressing a key, the test will "time out" and continue (this usually takes about 20 seconds).

If CONTROL D is pressed during the Keyboard keys check, the lengthy memory delay test will be ommitted from Self Test (Self Test will continue after pressing CONTROL D). If CONTROL C is pressed, the terminal will exit Self Test and enter Adjustment Self Test. Any other key pressed will cause the normal Self Test program to continue.

As Self Test continues running, the eight Keyboard lights will light with the binary light code of the test being run. When a fatal error occurs during a particular test, its identifying light pattern stays on the eight indicator LEDs at the top of the Keyboard, and the bell rings twice. These lights are the binary equivalent of a hexidecimal value assigned to each major set of tests. The error code tables (in this appendix) list and define the codes, giving an explanation for each error condition and suggesting which piece of circuitry malfunctioned. The tables are grouped together according to to the hardware being tested (this is not the order in which the tests are performed) for ease of reference. After the codes have been displayed, most problems can be narrowed down through the use of submessages. Submessages are displayed by first noting the error codes, pressing RETURN, and noting the next set of lights displayed as the submessage. If RETURN is not pressed, self test will time-out after 20 seconds and display the submessage. In some instances, there may be up to three levels of submessages. The error code tables will tell how many submessages there are for each code.

After the display electronics have been checked, all error messages are printed on the display screen. Such screen-displayed error messages first print the name of the test or the hardware module being tested. Then a submessage on the next line tells which part of the test failed.

During the Delay Memory check (associated with Table D-8, RAM Tests) there is a 14 second wait for each 32K of RAM being tested. In a fully loaded terminal, this test can take up to 4 minutes to run. Do not be surprised about this delay; it does not mean that Self Test is "hung." If you wish to override this lengthy test, enter CONTROL D during the keyboard check and Self Test will skip over this test.

Error Code Tables

In the following tables, tests are grouped in modules according to the hardware being tested. Under each heading (test module name) is a short general description of the test and hardware it checks. Each table of error codes defines those codes that may appear while that test is running. Some error codes have submessages to be read. These submessages are listed directly under the error code. To determine which piece of circuitry malfunctioned, read the list of active circuits for each test. Since many circuits are used in several tests, eliminate as "good" those circuits that passed all previous tests.

The tables are grouped together for referencing convenience rather than the order in which the tests occur. Tables start with the error code FE (1111 1110) and are listed in descending order of the binary codes. Each table will have the same four most significant binary bits in the error code. Table D-2 shows the order of the error code tables.

Table D-2

SELF TEST ERRORS DIRECTORY

TEST MODULE	HEX CODE(*)	TABLE NUMBER
KEYBOARD/PROCESSOR	Fx	D-3
PROCESSOR BOARD	Ex	D-4
RAM/BUS HOST PORT	Dx	D-5
HEXIDECIMAL TO DECIMAL EQUIVALENTS		D-6
SYSTEM OPTION ROMS	Cx	D-7
RAM TEST	Bx	D-8
CMOS MEMORY	Ax	D-9
RASTER BUS AND BOARD CHECK	8x	D-10
7X ERROR CODES(**)	7x	D-11
3PPI (OPTION 10)	6x	D-12
DISK (OPTION 42/43)	5x	D-13
TABLET (OPTION 13/14)	4x	D-14

(*) x indicates this Hexidecimal digit will change within the table.
(**) The 7x error codes are not part of Self Test but are rather error codes that are generated if a problem is found during normal use of the terminal. Self Test does not have to be initialized in order to receive these error codes.

Keyboard Check and Lights (F)

The following codes will be displayed during the Keyboard tests. For a description of these tests, see "Starting Self Test" earlier in this section.

Table D-3

KEYBOARD/PROCESSOR BOARD ERRORS

ERROR CODE Binary / Hex		EXPLANATION
1111 1110	FE	Error at beginning of keyboard lights test. (Circling lights test happens here.)
1111 1101	FD	Error at end of keyboard lights test.
1111 1100	FC	Error during keyboard keys test.
1111 1010	FA	Error while loading Keyboard Identification Code.

Submessage: (printed on screen)

"Keybrd -ID XX"

XX is the option number of the keyboard attached (example: a Swedish keyboard is Option 4C). This test then checks the validity of that Option number against the ROM Option number installed, and displays this message if the wrong ROMs or no ROMs (for the option) are present. See Figure D-2 for the location of the keyboard ROMs.

"Keybrd -ID fail"

The identifcation test will fail when the terminal cannot reset the keyboard and read the keyboard option number. This may be caused by a broken or loose connection.

CIRCUITS USED: Look for problems on Keyboard, Keyboard interface on the Processor Board, and keyboard ribbon cable and connectors.

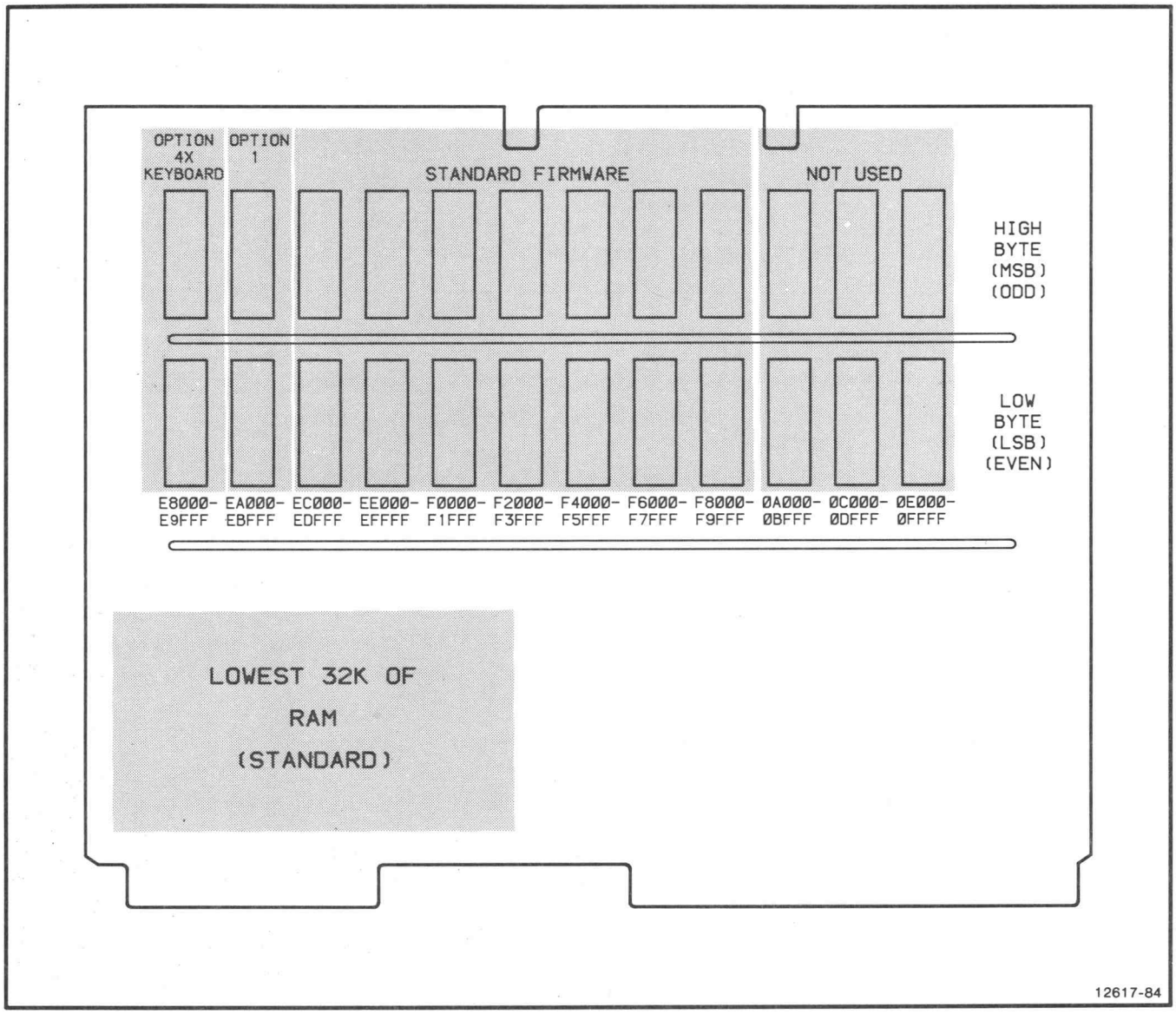

Figure D-2. RAM/ROM Board.

Processor Check (E)

At this time, Self Test does a more thorough test of Processor board and Keyboard functions. The processor and its related hardware are systematically exercised.

Table D-4

PROCESSOR BOARD ERRORS

ERROR CODE Binary / Hex		EXPLANATION
1110 1111	EF	Error detected during Timer test.

Submessage: Bell; press RETURN, read light code. (a)

The submessage for the timer test will consist of the following parts: The highest four bits will be one of two codes, the lower four bits will be one of two possible codes. These codes are listed below.

0001 ----	Failed static test; tests timers' outputs for high/low values.
0010 ----	Failed dynamic test; tests timers for correct count vs. processor execution.
---- 0000	Failure in Timer 0 (I/O address 00E1).
---- 0001	Failure in Timer 1 (" " 00E3).

NOTE - Timer 2 cannot be tested at this point. It is checked later during the host port check.

1110 1110	EE	Failure during timer initialization.
1110 1100	EC	Error during standard ROM checksum test.

(a) Submessages are obtained in the following manner: When an error is noted, the bell will ring before each submessage. After noting the error bits (read from the keyboard LEDs), press RETURN, then read the submessage as the next set of lights displayed.

Table D-4 (cont.)

PROCESSOR BOARD ERRORS

ERROR CODE Binary / Hex		EXPLANATION
1110 1100	EC	Error during standard ROM checksum test.

Submessage 1: Bell; press RETURN, read light code. (a)

X X nnnn nnnn	Address of ROM problem in Hex XX000. (i.e., 1111 1110 = FE --> Address where problem found is FE000 'X'. This is first ROM pair on the Processor board.) See Figure D-3 for the location of the Processor board ROMs.

Submessage 2: Bell, press RETURN again, read light code. (a)

This submessage consists of two parts, with the highest four bits consisting of one of three codes, and the lowest four bits consisting of one of three possible codes. These codes are seen below.

0001 ----	ROM(s) not present.
0010 ----	ROM(s) checksum error.
0011 ----	Standard ROMs position check.
---- 0001	Problem isolated to high ROM of pair.
---- 0010	Problem isolated to low ROM of pair.
---- 0011	Problem found in both ROMs of pair.

(a) Submessages are obtained in the following manner: When an error is noted, the bell will ring before each submessage. After noting the error bits (read from the keyboard LEDs), press RETURN, then read the submessage as the next set of lights displayed.

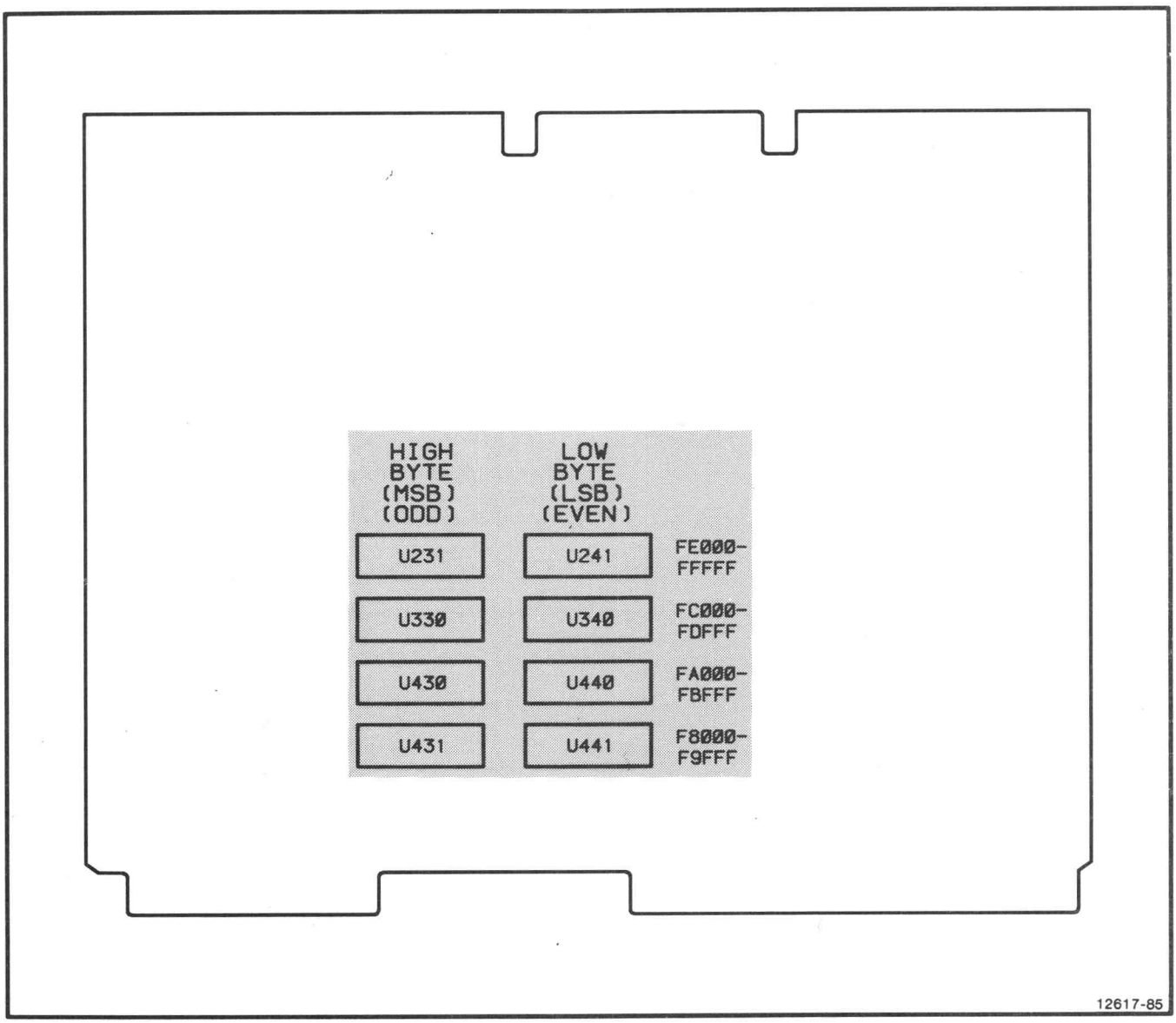

Figure D-3. Processor Board ROMs.

Table D-4 (cont.)

PROCESSOR BOARD ERRORS

ERROR CODE Binary / Hex		EXPLANATION
1110 1011	EB	Error detected in Interrupt Handler Check
Submessages: (printed on screen)		
Interrupts-Static Error: XX		Bits that cannot be set in Interrupt Register (I/O base address 00EA).
Interrupts-Dynamic Address: XX		Level 5 interrupt performed. Failed to reach interrupt vector address: XX + (4 x 5). (b)
Interrupts-Div by 0 Address: XX		A divide by 0 instruction was performed, but did not vector through location 0. XX equals base interrupt address. (c)

CIRCUITS USED: Interrupts circuit block on Processor Board.

(b) Level five is the easiest level of interrupt to force (hence x5). Each time an increment of a level is made, it moves up four bytes in memory (hence the 4). XX equals the base interrupt address.

(c) This message with XX=00 most likely implies an earlier version of a 8086 processor chip not acceptable for Processor board operation.

NOTE - If either T1 or T2 inputs to the interrupt chip are stuck at a TTL low, Self Test cannot detect this condition. Also, if an "interrupt level" output (from the interrupt chip) is stuck at a TTL low, Self Test cannot detect this condition, either. If the interrupt chip seems to be causing a problem, examine the outputs with an oscilloscope, or replace the Processor board.

Communications and Bus Checks (D)

This set of tests examine the operation of the main terminal bus and the host I/O port. This is accomplished by writing to low RAM (located between 0000 and 7FFF) its own address as data. It then reads this address back, using the comparison as a bus check. This assumes RAMs are good.

Table D-5

RAM/BUS AND HOST PORT ERRORS

ERROR CODE Binary / Hex	EXPLANATION
1101 1111 DF	Problems with low bits of main terminal bus or addressing via this bus.
Submessage 1: Bell, press RETURN, read light code. (a)	
X X nnnn nnnn	XX indicates the base address of the RAM that caused the bus problem: XX000 'X'. (i.e., 00 = 00000 and 20 = 20000.)
Submessage 2: Second Bell, press RETURN, read light code. (a)	
Y Y nnnn nnnn	YY is the Low data byte, showing which bits are in error. If these bits are all ones, address bit zero is likely to be bad.
Submessage 3: Third Bell, press RETURN, read light code. (a)	
Z Z nnnn nnnn	ZZ is the High data byte, showing which bits are in error. If these bits are all ones, byte high enable (BHEN) is probably bad.
	NOTE: If YY and ZZ are all ones, this indicates a time-out problem while attempting to access a RAM.

(a) Submessages 1 to 3: Bell rings before each submessage; after noting the error bits, press RETURN, read submessages as the next set of lights displayed.

Table D-5 (cont)

RAM/BUS AND HOST PORT ERRORS

ERROR CODE Binary / Hex		EXPLANATION
1101 1110	DE	Problem with the high bits of the main bus or addressing via this bus. Here it is writing high RAM (between 8000 and highest address) its address as data; then reading it back.

Submessages: The same three submessages occur here as for DF.

CIRCUITS USED: All RAM locations 0000 to 7FFF and 8000 to top RAM address, bus lines connecting Processor and RAM/ROM board.

1101 1101	DD	Error detected during host port I/O address check

Submessage: (printed on screen)

"Host Port-Registers
Expect: XX Receive: YY"

This test checks the reset of the USART. Ater resetting USART, it reads the data at status I/O address: E2.
It expects to read XX. If instead it receives YY (where XX not = YY) this means the test failed and the USART cannot be reset.

"Host Port-Register
Expect: XX-YY Receive: ZZ-AA"

The test checks USART Latch (I/O address EB), and USART Interrupt Request (" " E8).

XX - Latch status expected; is 0 if no bits are in error.

YY - Interrupt Request bits in error; is 0, if no bits are in error.

ZZ - Latch Status bits in error.

AA - Interrupt Request bits in error.

Table D-5 (cont)

RAM/BUS AND HOST PORT ERRORS

ERROR CODE Binary / Hex	EXPLANATION
1101 1100 DC	Error detected during host port baud rate/ character check

Submessage: (printed on screen)

"Host Port-Baud/Character
Baud: XXXX Expect: YY-AA Receive: ZZ-BB"

XXXX - Baud rate in hex (see Table D-6).
YY - character sent.
AA - USART data status bits in error; expect 00 (I/O address E4). See Figure D-4.
ZZ - character received.
BB - USART Data Status bits in error.

CIRCUITS: All RAM locations 0000 to 7FFF and 8000 to top RAM address bus lines connecting Processor and RAM/ROM board.

NOTE - Self Test cannot check the following signals if they are tied to a TTL low: MWTC; PFAIL; BCLK; INT1; INT2; INT3; INT4; INT6; INT7; BREQ; BGT.

7800

DE

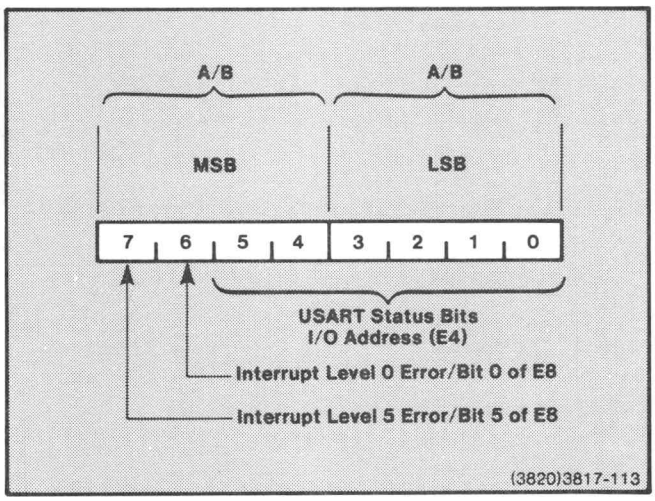

Figure D-4. Status Byte.

The following table may be used to convert Hex numbers received into decimal numbers.

Table D-6

HEX-TO-DECIMAL EQUIVALENTS

HEX NUMBER	DECIMAL NUMBER
12C	300
25B	600
4B0	1200
708	1800
7D0	2000
960	2400
E10	3600
12C0	4800
1C20	7200
2580	9600
4B00	19200
9600	38400

MEMORY TESTS:

ROM Check (C)

This set of tests examines the operation of all ROMs on the RAM/ROM board and all option ROMs. The ROMs on the Processor board were tested along with the processor in previous tests. For the locations of the bad ROMs on the RAM/ROM board, refer back to Figure D-2.

Table D-7

SYSTEM/OPTION ROMS ERRORS

ERROR CODE Binary / Hex	EXPLANATION
1100 1110 CE	Error found during ROM checksums test.
Submessages:	Error messages are same as for Standard ROM checksum test; see Table D-4.
1100 1101 CD	ROMs found in wrong position (options only).
Submessages: (Displayed on screen) "ROM-Position Address: XXXX Expect: YY-ZZ Receive: AA-BB" ROM Set: CC-Fail	Address XXXX -- the base address of the ROM pair being checked. Expect YY-ZZ -- 1) YY is the ROM Set number (same as option number. 2) ZZ indicates even or odd ROM of pair. (If ZZ is odd, then odd ROM is problem; if ZZ is even, then even ROM is problem). Receive AA-BB -- found ROM Set number AA (instead of YY); BB (like ZZ) indicates odd vs. even of pair. ROM Set CC-Fail -- CC is option (ROM Set) number of ROM that failed.
Example> Address: 1600 Expect: 42-17 Receive: 42-15 ROM Set: 42-Fail	Means -- that the base address of the ROM pair being checked is 16,000. 42 is the ROM set number expected (disk). 17 is base address + 1 (odd ROM of pair). If 16 is base address + 0 (even ROM " "). The test found 42-15 at the address; 42 was the ROM Set, and 15 means the odd ROM for location 14,000 was found there (instead of odd ROM for 16,000).

Table D-7 (cont)

SYSTEM/OPTION ROMS ERRORS

ERROR CODE Binary / Hex		EXPLANATION
1100 1100	CC	ROM version compatibility problem

Submessage: (printed on screen)

"ROM-Version
ROM Set: XX-VV Expect: YY-ZZ Receive: AA-BB
ROM Set: CC-Fail"

ROM Set used for reference is XX (Note 1), and its version number is VV.
"Expect YY-ZZ" refers to the expected ROM option name YY, and version number ZZ for for the ROM Set being checked.
"Receive AA-BB" reports the actual ROM name (AA) and version (BB) in same socket.

Example> ROM Set: 00-05 Expect: 42-03 Receive: 42-01
Means -- The main system firmware (called 00) is version 5. It expects Option 42 ROMs with version 3 or higher to be installed.

Instead, it finds Option 42 ROMs, with only version 1 firmware, installed.

ROM Set: CC-Fail
ROM failure -- CC is number of Option where version problem appeared. This ROM set is mapped out of the option.

CIRCUITS USED: RAM/RROM Board ROMs and circuits, and ROMs on option boards.

Note 1: XX is option number. System ROMs number is always 00.

RAM Check (B)

This series of tests perform a systematic check of all system RAMs. Each set of tests are grouped, and each such group uses the same type of error reporting scheme (light codes). Refer back to Figure D-2, which shows the physical location of the Standard 32K of RAM.

In the following tests, the RAM Memory Delay Check (BB) generates a light code which may remain lit for as much as 14 seconds while the test is running. This does not indicate an error. An error is indicated by a bell accompianied by a light code which stays on indefinately. The lengthy Delay Memory Check may be overriden by entering CONTROL D during the keyboard check.

NOTE

In the following table, "Standard 32K RAM" refers to the RAM from hexidecimal address 0000 to 7FFF. "Optional" RAM refers to any extended RAM options installed in the 4113, starting at hexidecimal address 2000.

Table D-8

RAM TEST ERRORS

ERROR CODE Binary / Hex		EXPLANATION
1011 1111	BF	Standard 32K of RAM, walking ones check. (Here each bit is set and tested, in order from left to right, hence the "walking ones" term). This light code is accompanied by one of the following light code submessages.
		Submessage 1: Bell rings, press RETURN, read light code. (a)
X X nnnn nnnn		XX indicates the address of the RAM problem at XX000 'X'.
		Submessage 2: Second bell, press RETURN, read light code. (a)
Y Y nnnn nnnn		YY is the Low Data byte, showing which bits are in error.
		Submessage 3: Third bell, press RETURN, read light code. (a)
Z Z nnnn nnnn		ZZ is the High Data byte, showing which bits are in error.
1011 1110	BE ------ (b)	Error in "walking zeroes check"; Standard 32K RAM.
1011 1101	BD ------ (b)	Error in "all ones check"; Standard 32K RAM.
1011 1100	BC ------ (b)	Error in "init (zero check)"; Standard 32K RAM.

(a) Submessages are obtained in the following manner: when an error is noted, the bell will ring. After noting the error bits (read from the Keyboard LEDs), press RETURN, then read the submessage as the next set of lights displayed.

(b) If one of these messages is displayed as an error (the bell rings), the three submessages earlier in the table will have to be read in order to locate the problem.

Table D-8 (cont)

RAM TEST ERRORS

ERROR CODE Binary / Hex			EXPLANATION
1011 1011	BB ------	(b)	Error in "RAM memory delay check." During the RAM memory delay check, data is held for 14 seconds and then rechecked. The light code will remain lit for this time.
1011 1010	BA ------		"RAM/ROM Memory Map Generation" error. This test checks for RAM and ROM and the absence of RAM/ROM and generates a corresponding memory map.

Submessage 1: Bell; press RETURN, read light code. (a)

X X nnnn nnnn	Address of RAM/ROM problem in Hex address XX000. (i.e., 1111 1110 = FE---> Address where problem is found is FE000 'X'. This is the first ROM pair on the Processor board. See Figure D-3 for the location of the Processor board ROMs.

Submessage 2: Bell; press RETURN again, read light code. (a)

Only the four least significant bits of this submessage is to be read. The upper four bits are "don't care" bits, and are not to be read as part of the message.

---- 0000	Memory Timeout problem.
---- 0001	Problem Isolated to high RAM/ROM of pair.
---- 0010	Problem Isolated to low RAM/ROM of pair.
---- 0011	Problem found in both RAM/ROM of pair

(a) Submessages are obtained in the following manner: when an error is noted, the bell will ring. After noting the error bits (read from the Keyboard LEDs), press RETURN, then read the submessage as the next set of lights displayed.

(b) If one of these messages is displayed as an error (the bell rings), the three submessages earlier in the table will have to be read in order to locate the problem.

Table D-8 (cont)

RAM TEST ERRORS

ERROR CODE Binary / Hex			EXPLANATION
1011 1001	B9 ------	(b)	Error in "walking ones check"; Optional RAM.
1011 1000	B8 ------	(b)	Error in "walking zeroes check"; Optional RAM.
1011 0111	B7 ------	(b)	Error in "all ones check"; Optional RAM.
1011 0110	B6 ------	(b)	Error in "init (zero check)"; Optional RAM.
1011 0101	B5 ------		Error during RAM stack building.
1011 0100	B4 ------		Error in operating system vector table (lowest 32K of RAM)

(b) If one of these messages is displayed as an error (the bell rings), the three submessages earlier in the table will have to be read in order to locate the problem.

CMOS Check (AF)

When a CMOS memory error is detected, the LEDs will show the "AF" pattern (1010 1111), and a message is written on the display screen. The only time a full CMOS check is performed is during Adjustment Self Test.

NOTE

The following CMOS error message reports a change in default parameters. This may be caused by either: changing EPROMs, or by a CMOS battery/circuit failure.

Table D-9

CMOS MEMORY ERRORS

ERROR CODE Binary / Hex	EXPLANATION
1010 1111 AF	CMOS check
Submessage: (printed on screen)	
"Cmos-Error I/O Address: XXXX Expect: YY41 Receive: ZZZZ	XXXX = Address of problem. If it is addressing correctly, the address will read FFFE. YY41 = YY is the system version number (taken from EPROM) and 41 indicates 4110 series product. ZZZZ = this is what is actually read, instead of YY41.
"Cmos-Checksum"	Checksum error detected.
"Setup Default-Reset"	CMOS parameters have been updated. This is the same as the Power-up message.

Raster Bus Checks (8)

The Self Test program tests the five principle circuit boards in the Raster Bus: Vector Generator, both Raster Memories, Video Controller, and Color Map boards. This set of tests does not exercise or check the Display Module.

Table D-10

RASTER BUS AND BOARD ERRORS

ERROR CODE Binary / Hex	EXPLANATION
1000 1111 8F	4113 Video Controller tests:
Submessage: Bell, press RETURN, read light code. (a)	
0000 0001	Bad vertical interrupt.
0000 0010	Video Controller not present.
0000 0011	No vertical interval interrupt.
0000 0100	Vertical interval too short.
0000 0101	Vertical interval too long.
0000 0110	Vector Gnerator ready, but interrupt never flagged.
0001 0001	Vector Generator problem.
1000 1110 8E	4113 Raster Memory tests:
Submessage: Bell, press RETURN, read light code. (a)	
0000 0001	Raster Memory fault, or Color Map board not present
0000 0010	No RND flag, test hung.
0001 0001	Vector Generator problem.
1000 ----	Optional Memory Plane Error (Planes 0 and 1).
1010 ----	Optional Memory Plane Error (Planes 2 and 3).
1000 1101 8D	4113 Vector Generator tests:
Submessage: Bell, press RETURN, read light code. (a)	
0000 0001	Bad Vector Generator register.
0001 0001	Vector Generator Board not working.

(a) Submessages are obtained in the following manner: When an error is noted, the bell will ring. After noting the error bits (read from the keyboard LEDs), press RETURN, and read the submessage as the next set of lights displayed.

Table D-10 (cont)

RASTER BUS AND BOARD ERRORS

ERROR CODE Binary / Hex	EXPLANATION
1000 1100 8C	Raster Memory Addressing Tests:
Submessage: Bell, press RETURN, read light code. (a)	
0000 0001	Raster Memory Address Fault, or Color Map Board not present.
0001 0001	Vector Generator Board not working.
1000 1010 8A	Color Map Board Error
Submessage: Bel, press RETURN, read light code (a)	
0000 0001	Color Map Board not present
0000 0010	Color Map bit wrong
CIRCUITS: Replace Video Controller, Vector Generator, Raster Memory, or Color Map boards, as indicated above. Check bus and cable connections first.	

(a) Submessages are obtained in the following manner: When an error is noted, the bell will ring. After noting the error bits (read from the keyboard LEDs), press RETURN, and read the submessage as the next set of lights displayed.

The 7X Error Codes

The following error codes (listed in Table D-11) are not part of normal Self Test. That is, they are not tests that are run during the Self Test diagnostic program, but are rather error codes that will be displayed during normal use of the terminal if something fails. In the case of these error codes, the bell will ring twice when displaying each code. All of the 7X errors are fatal and must be repaired before the terminal may resume normal operation.

Self Test does not have to be initialized in order to recieve these error codes.

Table D-11

7X ERROR CODES

ERROR CODE Binary / Hex	EXPLANATION
0111 1111 7F	CMOS memory lacking Could not get enough memory for system initialization. Try resetting CMOS parameters.
0111 1110 7E	No monitor level procedure. A monitor procedure was called from an interrupt service routine (ISR). This error should only happen when a file is downloaded containing software ISRs.
0111 1101 7D	System data structures scrambled-RAM data lost Try resetting the terminal or checking any routines created in the terminal or loaded into the terminal that may be writing into the wrong area.
0111 1100 7C	Unexpected or Illegal interrupt. If this error code is generated, it is suggested that Self Test be run to pinpoint the interrupt failure area. Note: could spurrious interrupt been generated by operator?
0111 1011 7B	Error Handler could not set dynamic memory for an error message. Check the user allocation of RAM through the STA MEM (status memory) command for available memory.

4113 Option Error Codes

Self test is extended to three options that can be installed in the 4113. Option 42 and 43 (disk drives) require a Disk Controller board. This circuit board contains ROMs which allow it to test itself when Self Test is run. Likewise, the 3PPI board and Tablet Interface board (options 10 and 13/14 respectivly) also contain ROMs which allow these circuit boards to test themselves when Self Test is run. Options 24 through 29 (extended RAM options) are also checked during Self Test, but by the normal firmware, and not by firmware in ROMs on the RAM boards. RAM above the standard 32K bytes is noted as "Optional RAM" in the RAM test (located earlier in this appendix).

Error messages for the 3PPI board, Disk Controller board, and Tablet Controller board are the same for both the 4114, 4113, and 4112 terminals, since these boards are interchangable in those terminals.

The physical and address locations of the ROMs on the 3PPI, Disk Controller, and Tablet Controller boards are shown in Figures D-5, D-6, and D-7. These ROMs contain the firmware that hold the Self Test program for that circuit board.

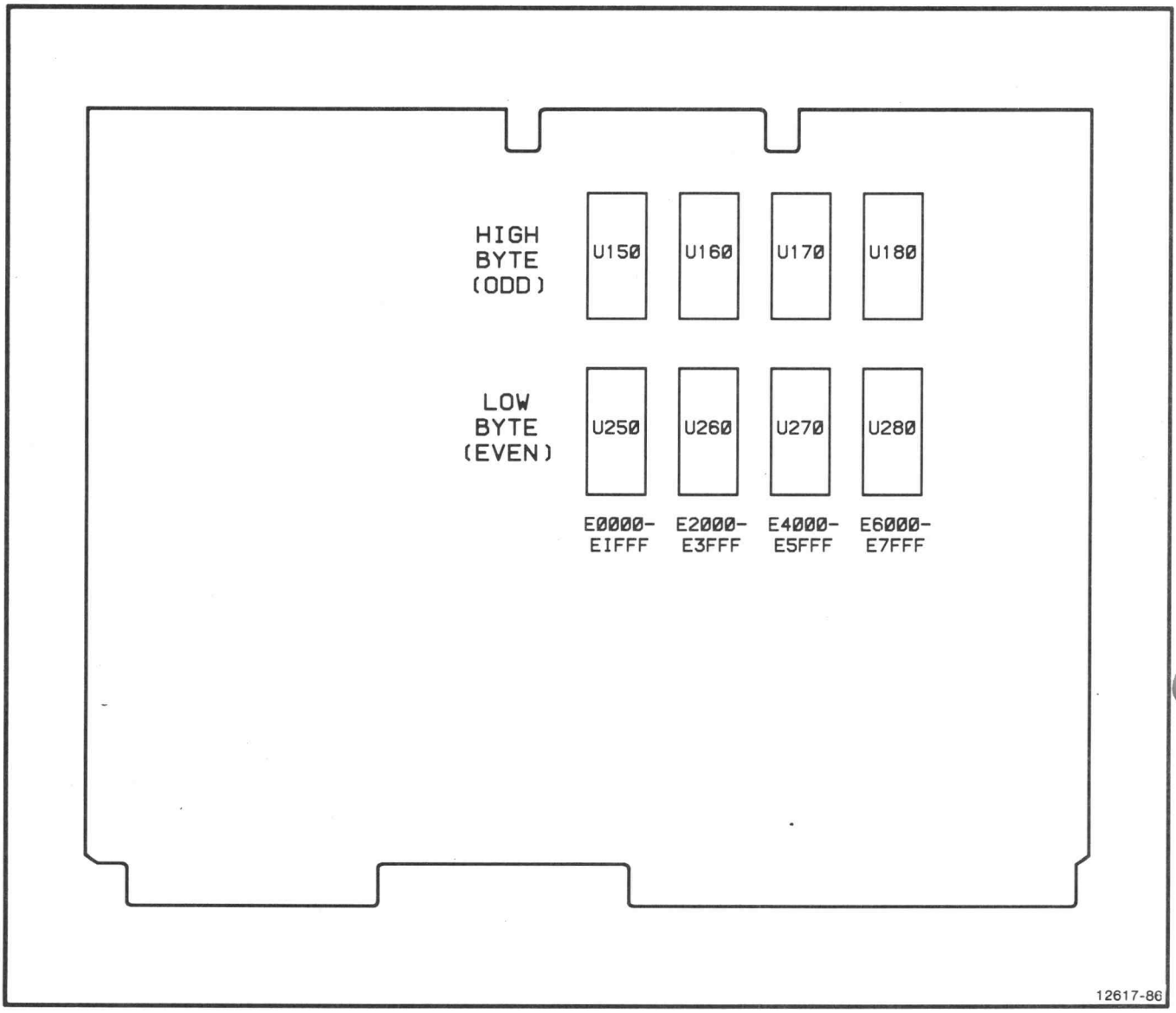

Figure D-5. 3PPI Board ROMs

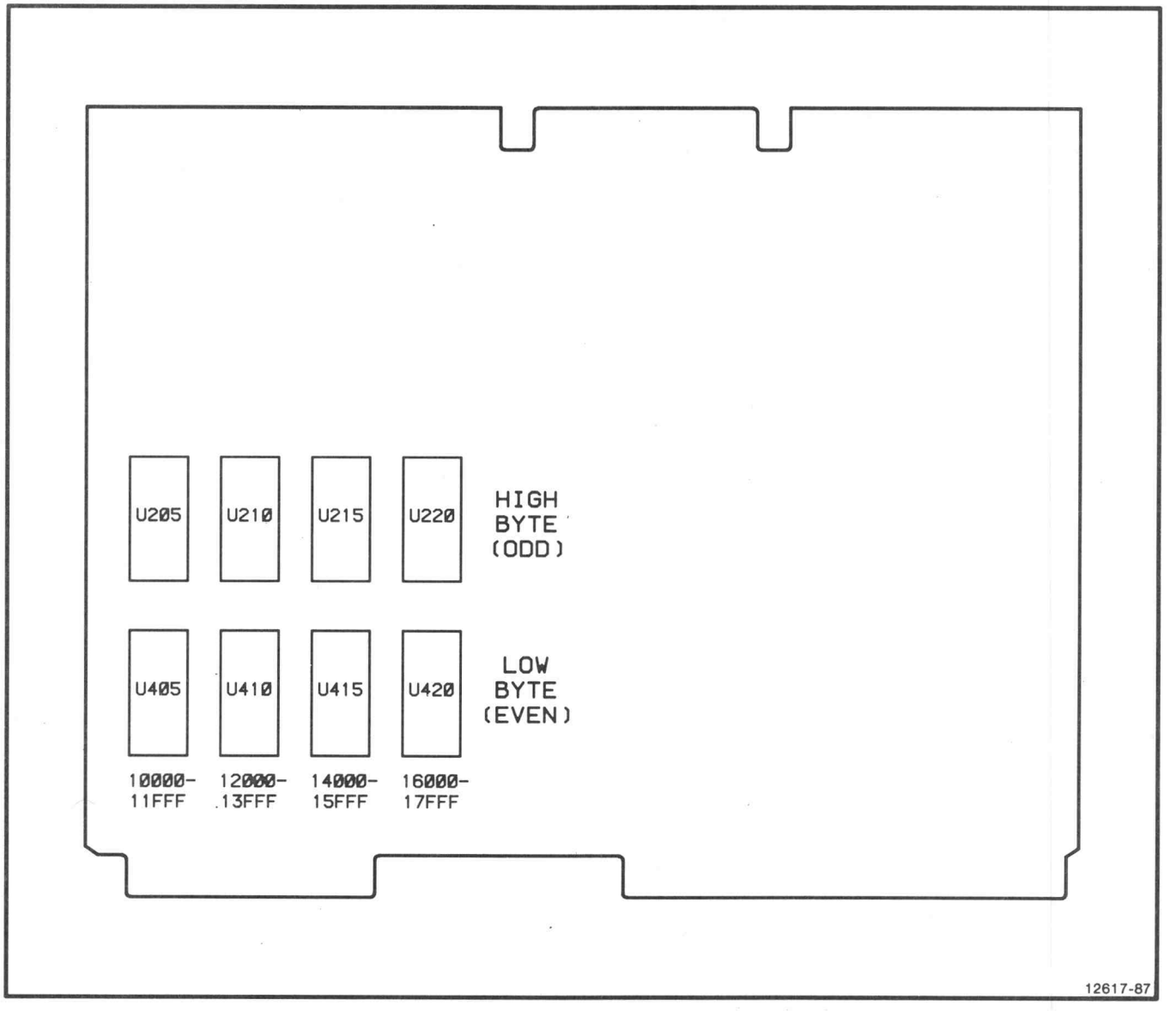

Figure D-6. Disk Controller Board ROMs

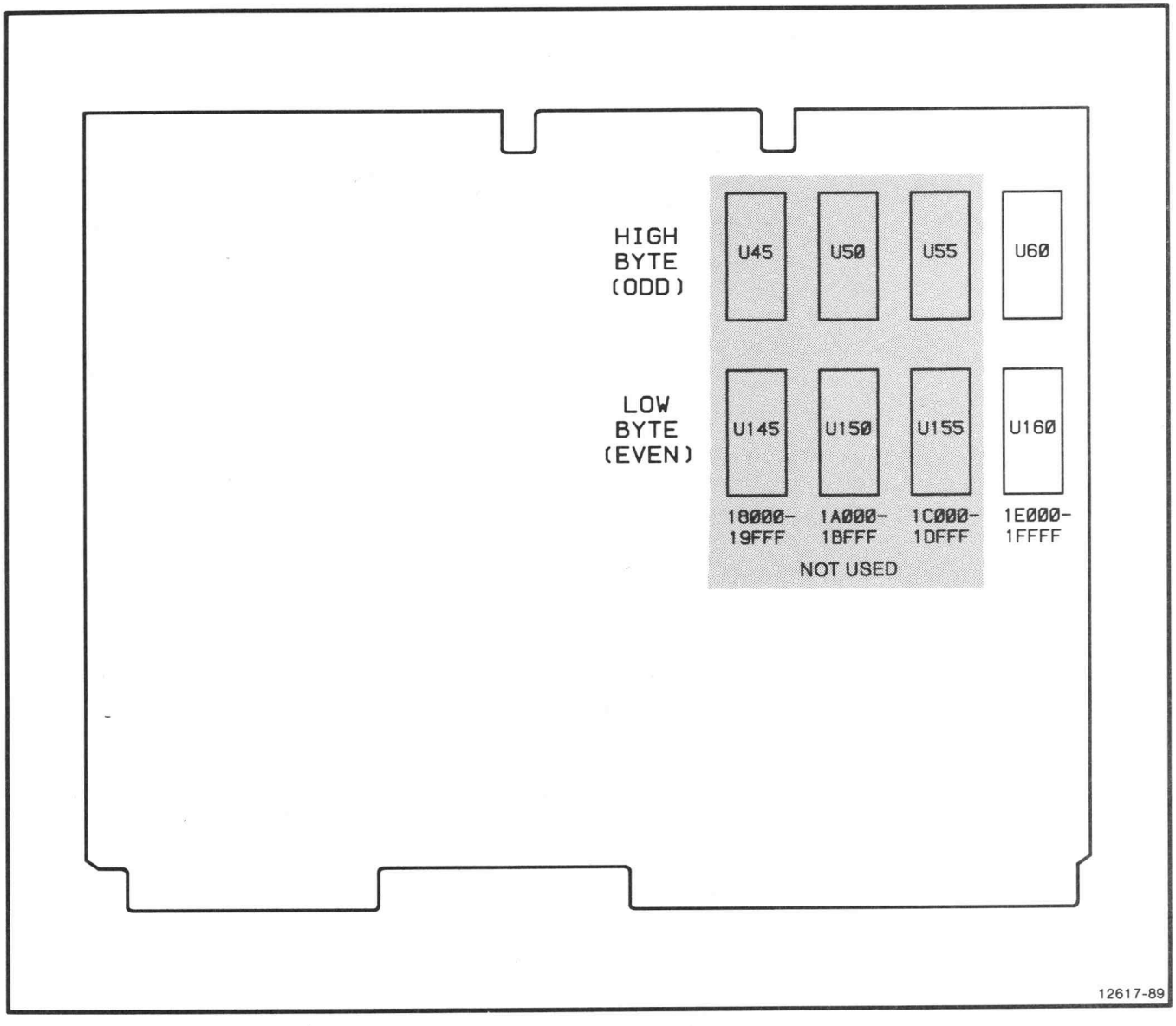

Figure D-7. Tablet Controller Board ROMs.

3PPI Check (6)

This test checks the operation of the 3PPI board. If the 3PPI board is installed, it will be automatically be checked when Self Test is run.

Table D-12

3PPI ERRORS

ERROR CODE Binary / Hex	EXPLANATION
0110 1111 6F	Error detected during Register check.

Submessage:(printed on screen)

"3PPI-Register
Sent: XX Expect: YY Receive: ZZ"

Explanation:
The 3PPI control register pattern sent was XXXX. During the test, the register was checked for the expected YYYY (hex). The actual contents read were reported as ZZZZ.

0110 1110 6E Error detected during 3PPI Character check.

Submessage (printed on screen):

"3PPI-Baud/Character
Sent: XXXX Expect: YY-ZZ Receive: AA-BB

Explanation:
The baud rate was set to XXXX (hex). During the test, the character sent was YY (hex). The character received was ZZ (hex). Interrupt bits expected are ZZ (00), what was received was BB.

The Character check test uses internal loop-back testing. There is no interaction between this test and external equipment. The equipment is operation at either the system preset rate or 1200 baud, whichever is higher.

NOTE - Refer the the table earlier in this section to convert the hexadecimal numbers received into decimal numbers.

Using Self Test to Test the Disk Options

The 4113, when equipped with any options such as the disk, amounts to a mini-system. Self Test helps to isolate problems to a part of this system. However, trouble shooting procedures should check the first and most obvious kinds of faults first: diskette problems, or line voltage fluctuations. Avoid blindly zeroing in on the disk options, thus overlooking a possible problem in the main terminal hardware. When problems occur that seem to be the fault of the terminal's disk option, be sure to have this Service Manual, 4110 Series F42/43 Disk Options Service Manual, and the flexible Disk Drive Unit Instruction Manual on hand for referencing.

The Option 42/43 check is more complecated than any of the previous checks because of electromechanical operation of the option. Some troubleshooting tips for this option follow.

Hard and Soft Errors

When disk operations fail to execute properly, they are classified as:

- o "Soft errors" - recoverable and random in nature, or
- o "Hard errors" - persist after several retries.

Soft errors, related to the disk, happen when the R/W head can't find a file header, or when R/W data does not match expected data. The mechanical limitations of the disk and drive unit allows temporary misalignments, oxide dropout on the disk, dirt particles under the R/W head, etc. To keep these transitory problems from hanging-up the system, the terminal's processor recognizes the condition and issues ten retries. If the problem persists, the processor issues a head move command and again calls for another ten retries. If this is unsuccessful, a hard error is reported.

Hard errors, related to processing on the Disk Controller board, cause the main processor to issue ten retries. If the problem remains, the processor gives up and reports the condition as a hard error.

Another kind of hard error occurs when a write command finds that the disk is not inserted, the disk is write-protected, or a similar operator oversight. In such a case the problem appears constant, so no retries are made. The command/operation is aborted, and a message prompts the user to correct the problem.

Troubleshooting; Initial/Visual Checks

If your terminal is communicating properly with its host system but fails to read or write to its disk, look for disk related problems. Check the media, cables and connectors, or the part of the power supply module that provides disk unit power (+24 V).

Disk Media Problems. One of the first and easiest tests to make for disk related problems is to remove the current diskette and replace it with a known good diskette. Try writing to the good disk and then read it, and see if the problem persists. If the problem remains, it is either in the drive unit, the Disk Controller board, the connecting cables, or the power supply.

Disk Unit Faults. See the 119-0977-00 (or the equivalent) Flexible Disk Drive Instruction Manual.

Option 42/43 Check (5)

NOTE

Do NOT insert or remove a disk while Self Test is running as this will generate unexpected interrupts.

Table D-13

DISK OPTION ERRORS

ERROR CODE Binary / Hex	EXPLANATION
0101 1111 5F	Board Status Register Check

This test validates the operation of the hardware comprising the Board Status Register (at X'FC00'). Each Read/Write bit in the register is set (set=0) and tested; it is again reset and tested.

Submessage: (printed on screen)

"Disk - Board Status Register"	These tests check each bit in the BSR (Board Status Register).
"Disk - ADR19-1 not = 0"	Wrote a 0 to ADR19 (D3 of FC01) and read back a 1.
"Disk - ADR19-1 not = 1"	Wrote a 1 to ADR19, but read back a 0
"Disk - ADR19-1 not reset, =1"	Wrote a 0 to reset ADR19, but read a 1.
"Disk - INTE-0 not working"	Did not read back what was written at D6.
"Disk - BUSW-0 not working"	Did not read back what was written at D5.
"Disk - HDL3-0 not working"	Did not read back what was written at D3.
"Disk - HDL2-0 not working"	Did not read back what was written at D2.
"Disk - HDL1-0 not working"	Did not read back what was written at D1.
"Disk - HDL0-0 not working"	Did not read back what was written at D0.

Circuits used: Address Decode, Input Data Buffer, and Board Status Register.
NOTE: The first three submessages listed check the ADR19 Address Counter.

Table D-13 (cont)

DISK OPTION ERRORS

ERROR CODE Binary / Hex	EXPLANATION
0101 1110 5E	Initialize and check Disk Controller

The FDC is put into its command phase (regardless of its present state) via a series of command reads and writes. The following bits are tested for correct state:

Under X'FC00' -- D7 (EOC-1)
Under X'FC08' -- D7 (RQM-1) and D6 (DIO-1).

A SPECIFY command is then issued by the processor.

Submessages: (printed on screen)

"Disk - Controller Protocol" "EOC-0 is 0 after init"	FDC generates an unexpected interrupt, bit is in wrong state after initialization.
"Disk - DIO-1 is 0 - Write required"	FDC required a write to it, while processor expects to read from it.
"Disk - DIO-1 is 1 - Read required"	FDC requires a read from it, but processor expects to write to it.
"Disk - DIO-1 is 1 after init"	Bit D6 is in wrong state after initialization.
"Disk - RQM-1 remains 0"	FDC never sends RQM-1 (fails in 1000 tries).
"Disk - Cannot restore Protocol"	Runs initialization sequence, but cannot put FDC into a known state. (Processor has no idea what FDC is doing).

Circuits used: FDC, Board Status, Control Strobes, Data MUX, and Address Decode.

Table D-13 (cont)

DISK OPTION ERRORS

ERROR CODE Binary / Hex	EXPLANATION
0101 1101 5D	Drive present check

The processor issues a SENSE DRIVE 0 STATUS (SDS) command. Drive 0 should be present. The D7 (RQM-1) and D6 (DIO-1) are tested for correct states before and during the command.

Submessage: (printed on screen)

"Disk- F0: not present" — Drive 0 should always be present. This message means the FDC or Disk Drive control cannot find drive unit 0.

Circuits used: FDC's disk control I/F, and Disk Drive Control circuits.

0101 1100 5C	Intersystem Interrupt check

The following procedure is used to generate an interrupt: The heads are unloaded (should already be unloaded from last test), and the processor issues a RECAL DRIVE 0 command. Recal is executed, but the head does not move. The FDC does not know that the heads were unloaded, so it generates an interrupt. An error is also reported, unless head was already at Track 0.

Table D-13 (cont.)

DISK OPTION ERRORS

ERROR CODE Binary / Hex	EXPLANATION

The processor then issues the SENSE INTERRUPT STATUS (SIS) command to read the results of the RECAL command. The results of the SIS command are checked as well as RQM-1 and DIO-1.

Submessages: (printed on screen)

"Disk - Intersystem Interrupt Check"

"Disk -Bad FC00 init"	Board Status Register contains error (different state than expected).
"Disk -Bad FC08 init"	FDC status register contains an error (different state than expected).
"Disk -Bad FC00 RECAL-1 status"	Error in Board Status Register (BSR) after first byte of RECAL command written.
"Disk -Bad FC08 RECAL-1 status"	Error in FDC after first RECAL byte written.
"Disk -Bad FC00 RECAL-2 status"	Error in BSR after second RECAL byte written.
"Disk -Bad FC08 RECAL-2 status"	Error in FDC after second RECAL byte written.
"Disk -Level 7 interrupt not present"	Expected interrupt not present.
"Disk -Bad FC00 SIS status"	Error in BSR after Sense Interrupt status byte written.
"Disk -Bad FC08 SIS status"	Error in FDC after Sense Interrupt status byte written.
"Disk -ST0 data error"	Error in ST0, read at FDC.

Table D-13 (cont.)

DISK OPTION ERRORS

ERROR CODE Binary / Hex	EXPLANATION
Submessages (cont):	
"Disk -Bad FC00 ST0 status"	Error in BSR after ST0 status byte read.
"Disk -Bad FC08 ST0 status"	Error in FDC after ST0 status byte read.
"Disk -Track error"	Error in track number (PCN), read at FDC.
"Disk -Bad FC00 Track status"	Error in BSR after track number read.
"Disk -Bad FC08 Track status"	Error in FDC after track number read.
"Disk -Level 7 interrupt still present"	Interrupt still present.
Circuits used: Address Decode, Board Status, Control Strobes, Data MUX, and FDC.	
0101 1011 5B	DMA Operation check
Submessage: (printed on screen)	
"Disk - DMA transfer failed"	Data ('80') not found at current DMA address (RAM only).
Circuits: DMA State Machine, Data MUX, Control Strobes, Address Decode, Address Counters, Input Data Buffers, and Board Status blocks.	
0101 1010 5A	DMA addressing check
Both this test and the previous test must be completed before the DMA State Machine and the DMA Address Counters are fully tested; the testing of one requires the operation of the other.	
The DMA Address Counters are write only. The only way to look at these counters is to examine the most significant bit (MSB), which is at D4 of the Board Status Register (X'FC00').	
The twenty bit counters are subdivided into three groups: High Nibble (FC01), Middle Byte (FC02), and Low Byte (FC03). Each group is tested individually in the following manner:	

Table D-13 (cont)

DISK OPTION ERRORS

DMA Address Check (continued)

-- HIGH NIBBLE TEST --

Test high nibble first because all bits must ripple through the high nibble while testing the middle and low bytes.

STEP SET-UP

1. Load High Nibble with 0.
2. Does D4 = 0 ? See NOTE.

TEST

3. Load Middle Byte and Low Byte with X'FF.'
4. Step DMA.
5. Does D4 = 0 ?

TEST

6. Repeat steps 3 through 5 eight times.
7. On eighth time, does D4 = 1 ?
8. Repeat another eight times. (D4 should = 1 for these eight.)
9. On sixteenth time, does D4 = 0 ?

NOTE- If D=1 an error message is reported. All "D=N?" steps will cause an error unless the number is as expected. Error messages are found in this table.

Table D-13 (cont)

DISK OPTION ERRORS

DMA Address Check (continued)

-- MIDDLE BYTE TEST --

STEP SET-UP

10. Load High Nibble with 7.
11. Does D4 = 0 ?
12. Load Middle Byte X'FF.'

TEST

13. Load Low Byte with X'FF.'
14. Step DMA.
15. Does D4 = 0 ?
16. Reload Low Byte witX'FF' (leave Middle Byte since we are testing it).
17. Repeat steps 13 through 15; on 256th does D4 = 1? (Does High Nibble equal eight?).

SET-UP

18. Reload High Nibble with F.
19. Does D4 = 1 ?

TEST

20. Reload Low Byte with X'FF,' and Step DMA.
21. Repeat step 19 two-hundred fifty-six times.
22. On 256th time does D4 = 0 ? (High Nibble = 0)

-- LOW BYTE TEST --

Same procedure as Middle Byte test except the Low Byte and Middle Byte are reversed.

Table D-13 (cont)

DISK OPTION ERRORS

Error Messages for DMA Address Counters

Submessages (printed on screen):

"Disk - DMA Address Counters
- ADR19-1 Error

"Early 0-1 @ FC01"	Error detected at steps 2 or 5 (Counter reached 8 too soon)
"No 0-1 @ FC01"	Error detected at step 7.
"Early 1-0 @ FC01"	Error detected at step 8.
"No 1-0 @ FC01"	Error detected at step 9.
"Early 0-1 @ FC02"	Error detected at steps 11 or 15.
"No 0-1 @ FC02"	Error detected at step 17.
"Early 1-0 @ FC02"	Error detected at step 19.
"No 1-0 @ FC02"	Error detected at step 22.
"Early 0-1 @ FC03"	Same explanation as for FC02 messages,
"No 0-1 @ FC03"	above, except substitute FC03 for FC02
"Early 1-0 @ FC03"	in explanation of Middle Byte tests.
"No 1-0 @ FC03"	

These tests check the clocking and carries of one counter to the next.

Circuits used: Same circuit blocks as used in DMA Operation Check, except Data MUX not used.

Tablet Controller Check (4)

The light codes for the tablet are indicative of failure of the tablet to complete a Self Test sequence and the operation of the Tablet Controller board should be investigated.

During the tablet test, the proper error message is printed on the terminal screen if a test fails to pass. These submessages are accompianied by one of the follow light codes (listed in table D-14).

A soft error will allow the tablet to be used. It alerts the operator that a problem exists.

A fatal error removes the tablet from the interrupt routine of the terminal. The tablet can not be used until the problem is corrected and the error cleared.

Table D-14

TABLET ERRORS

ERROR CODE Binary / Hex	EXPLANATION
0100 1111 4F	Board Communications check error.
Submessage: (printed on screen)	
"Tablet -Board I/O Timeout"	
	May appear during either the Power Up sequence or Self Test. It indicates that the terminal firmware is unable to communicate with the Tablet Controller board, and that a processor timeout occurred wheen communication was attempted. This is a FATAL error.

Table D-14 (cont)

TABLET ERRORS

ERROR CODE Binary / Hex	EXPLANATION
0100 1110 4E	Data Register bit check error.
	Submessage: (printed on screen)"
	"Tablet -Data Register Bit Error"
	Each individual bit of the data register is tested for set and reset. Message indicates at least one bit is not acting properly. This is a SOFT error.
0100 1101 4D	Data Register count check error
	Submessage: (printed on screen) - Only one of the following submessages will accompany the light code:
	"Tablet -Data Register Counting Error (Low)"
	Indicates that the data register was incapable of counting from 0 to 31 by one. This is a SOFT error.
	"Tablet -Data Register Counting Error (High)"
	Indicates that the data register was incapable of counting from 0 to 65539 by 29. This is a SOFT error.

Table D-14 (cont)

TABLET ERRORS

ERROR CODE Binary / Hex	EXPLANATION
0100 1100 4C	Digitization check error.

Submessage: (printed on screen) - Only one of the following submessages will accompiany the light code:

"Tablet -Digitization Timeout Error"

A start digitization command was given to the tablet and one of the FIRE pulses was not returned within 0.5 seconds. This is a SOFT error.

"Tablet -Digitization Firing Sequence Error"

The status bits, indicating which data firing (X1, X2, Y1, Y2) is present, were out of sequence. This is a SOFT error.

"Tablet -Erroneous Interrupting Indication"

The tablet status indicates that it is trying to interrupt the processor when it should not. This is a SOFT error.

"Tablet -failed To Interrupt"

Indicates the tablet status is not trying to interrupt the processor when it should. This is a SOFT error.

"Tablet -Data Register Counting Error (Digitization)"

The data register failed to count at all during a start digitization. This is a SOFT error.

ADJUSTMENT SELF TEST

Adjustment Self Test is the third diagnostic program that the terminal uses to test itself. Adjustment Self Test is generally used to aid in adjusting the terminal or troubleshooting of the terminal. Adjustment Self Test requires that the technician select what pattern is to be generated or what test is to be run. Some of the things that Adjustment Self Test can do are:

- o Generate one of eight patterns to be used in adjusting the display.
- o Reset the CMOS parameters of the terminal.
- o Give the hexidecimal equivalent of the downstroke and upstroke of each key on the keyboard.
- o Perform a Host Port check for the terminal (this requires attaching a loopback connector).
- o Perform head movements of the disk drives if Option 42/43 is installed (this can aid in head alignment).
- o Test each one of the three peripheral interface ports if Option 10 (3PPI) is installed.
- o Test and allow the adjustment of the tablet surface accuracy if Options 13 or 14 (Graphic tablets) are installed.

Starting Adjustment Self Test

Adjustment Self Test is started in the same manner as Self Test and is entered into during the Self Test Keyboard Keys check. A procedure and some guide lines for Adjustment Self Test are outlined as follows:

1. Start Adjustment Self Test running by pressing and holding the SELF TEST and MASTER RESET buttons.

2. Release the MASTER RESET button.

3. After the keyboard lights begin to "cycle", release the SELF TEST button.

4. The keyboard LEDs will all turn on and then off and then "cycle" twice. This is the same thing that happens during Self Test.

5. At the end of the keyboard lights check, the keyboard bell will ring once. This prompts the user to press the CTRL and C keys at the same time.

6. Once CONTROL C has been pressed, the terminal will pause a few seconds and then display a general menu on the screen. The terminal is now in Adjustment Self Test.

7. The General Menu tells the user what key to press in order to test one part of the terminal (these keys are always one of the eight at the left top of the keyboard).

8. Once one of the keys designated by the General menu has been pressed, a second menu will be displayed.

The commands used during Adjustment Self Test are as follows:

- CONTROL C will return the user to the general menu ("411X menu").
- CONTROL D will return the user to the current menu.
- CONTROL E will exit Adjustment Self Test and return the terminal to normal use.
- Pressing SPACE BAR will repeat the test (with the exception of the Keyboard test).
- Pressing an illegal key (one not defined by the menu) can have one of two possible effects:
  a) If the menu is displayed, pressing an illegal key will print the "?Illegal Selection" message.
  b) If a particular test within a menu is being run, and the menu is not displayed, pressing an illegal key will cause the current menu to be displayed.
- Pressing any one of the keys defined by the menu will cause that test or pattern to occur. The letters "Sh" in front of a key designation on the menu means press the SHIFT key along with the designated key.

The remainder of this section describes each test that Adjustment Self Test can do.

The General Menu

The General Menu is the first display that will appear on the 4113 after Adjustment Self Test is entered. The general menu is common for all 4110 series terminals. An example of the general menu is shown below.

```
411X Menu
--
f1 4113 Display
f2 Processor Board
f3 Disk
f4 3PPI
f5 Tablet
--
Selection
*
```

The Disk, 3PPI, and Tablet functions only appear if that option is installed. The options may change key designations depending on which options are installed. For instance, if no disk options were installed, but the tablet and 3PPI options were, the 3PPI option would be selected by F3, and the Tablet option would be selected by F4.

During Adjustment Self Test, pressing CONTROL C will always cause this menu to be printed on the screen.

4113 Display Menu

After the general menu is obtained, the display menu may be selected from the general menu by pressing F1. This is the upper most left key on the keyboard. Once the 4113 Display Menu is selected, the following will appear on the screen:

```
4113 Display Menu
--
f1 Grid
f2 Gray Scale
f3 White Screen
f4 Dot
f5 Dot Grid
f6 Full Color
f7 Soft Screen
f8 Soft Dots
--
Selection
*
```

This is a list of the patterns available for use in adjusting the display module. For the proper use of these patterns during adjustment, see the display module adjustment procedure in the 4113 Display Module Service Manual.

In order to display one of these patterns, press the key associated with the pattern desired. After the pattern is selected, the following keys will have these definitions:

DIALOG KEY. The DIALOG key is defined as having the color red. When the light in the DIALOG key is on, the display pattern will contain red. To remove red from the pattern, press the DIALOG key. This will cause the light to go out, and red will be removed from the pattern.

SET UP KEY. The SET UP key is defined as having the color green. When the light in the SET UP key is on, the display pattern will contain green. To remove green from the pattern, press the SET UP key. This will cause the light to go out, and green will be removed from the pattern.

LOCAL KEY. The LOCAL key is defined as having the color blue. When the light in the LOCAL key is on, the display pattern will contain blue. To remove blue from the pattern, press the LOCAL key. This will cause the light to go out, and blue will be removed from the pattern.

SPACE BAR. The SPACE BAR will repeat the pattern. Everytime the pattern is repeated, the DIALOG, SET UP, and LOCAL key LEDs become lit.

When a pattern is selected, the DIALOG, SET UP, and LOCAL key LEDs become lit. By using these keys in combination, up to eight different color combinations can be seen for each pattern.

On the grid and scales, all patterns will be 16 x 12 (16 boxes in the horizontal direction, and 12 in the vertical). If there are 4 bit/planes installed in the terminal, there will be 16 shades of color or 16 grey shades stretching across the top of the screen in the gray scale and full color patterns. If there are only 3 bit/planes installed, there will only be eight shades, repeated twice in the 16 top horizontal boxes.

Processor Board Menu

Once the General Menu has been displayed on the screen, the Processor board menu can be selected from the general menu by pressing F2. Once F2 has been pressed, the Processor board menu will be displayed. An example of the Processor board menu follows:

```
Processor Board Menu
--
f1 CMOS-Reset
f2 Keyboard
f3 Host Port
--
Selection
*
```

Once the Processor board menu is displayed one of three possible tests may occur.

F1 CMOS-Reset

CMOS-Reset is used in order to restore the factory default settings of all the CMOS parameters. In order to do this, once the Processor board menu is displayed, press the F1 key. Once this key is pressed, the following message appears:

```
*f1
CMOS-Reset
Selection
*
```

This message means that the terminals operating parameters have been restored to their factory default setting.

F2 Keyboard

Pressing the F2 key will cause every key on the Keyboard to display two two-digit hexidecimal numbers. These numbers represent the 8 bit codes that the processor board generates for each downstroke and upstroke of a key. Each key will have a different hexidecimal code from another key, and each downstroke will have a different code from each upstroke. The first number of the upstroke code is always eight plus the first number of the downstroke code. The second character in the code is the same for both the downstroke and upstroke of the key. This routine is useful in determining if there is a processor board or keyboard problem. Figure D-8 shows the keyboard keycodes.

The only way to return to the Processor board menu is by pressing CONTROL D.

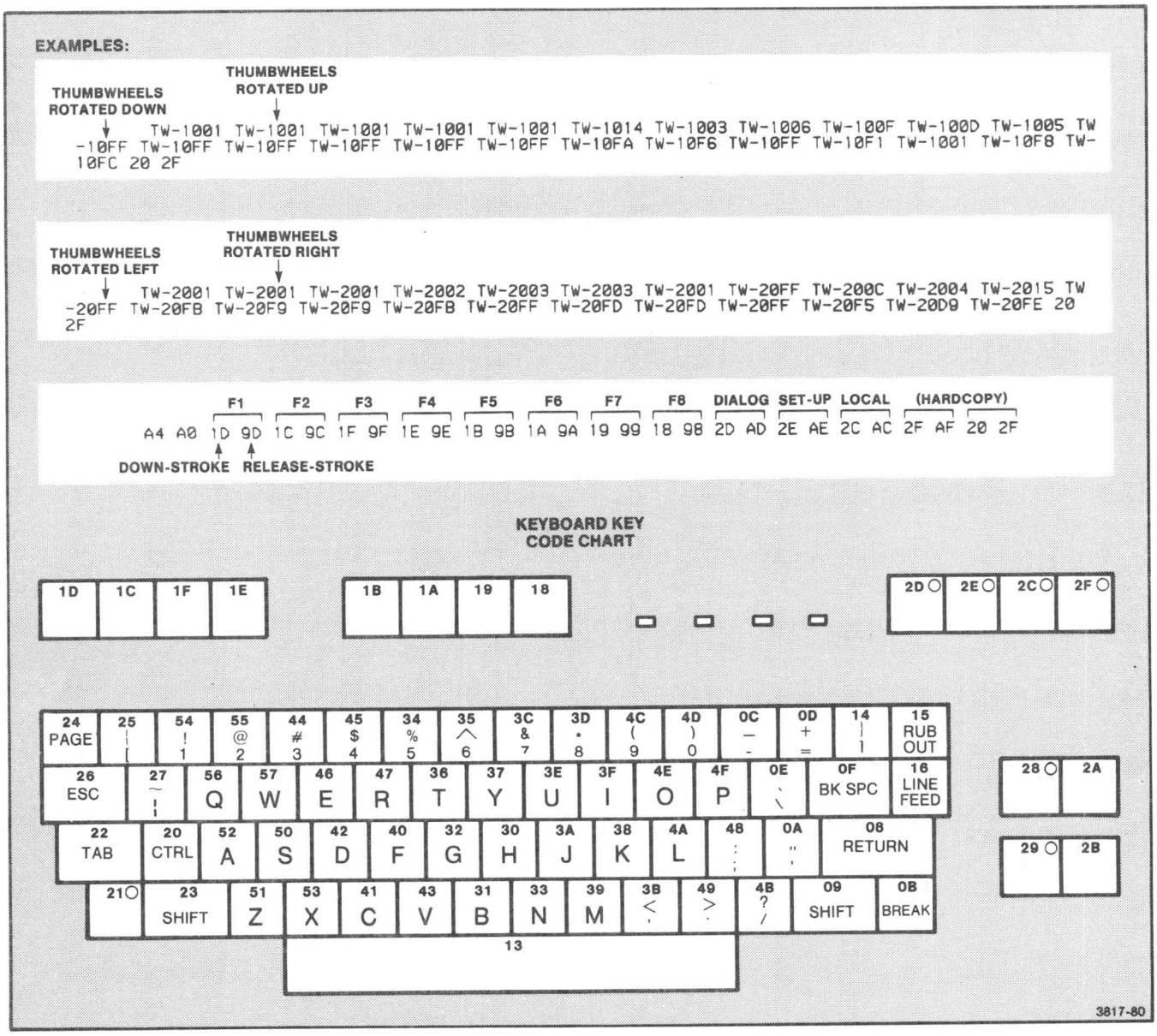

Figure D-8. Keyboard Keycodes.

F3 Host Port

The Host Port routine checks the validity of the output port of the terminal. Enter the Host Port routine by pressing F3. Once this is done, the screen will display the following:

Host Port
Attach Loopback
Press SpcBar

Connect the special loopback connector from the output port back to the input port. These connections are located on the rear panel of the pedestal/desk. See the Accessories list for the Loopback connector part number.

Once the cable is connected, press the SPACE BAR. When signals representing characters 7F through 00 (at baud rates 19200 through 300) are sent and recieved properly, the screen indicates this by printing "Complete". This message means the terminal is ready to go onto the next test.

If there is an error during the Host Port routine, the following submessage will appear on the screen:

"Host Port-Baud/Character
Baud: XXXX Expect: YY-AA Receive: ZZ-BB"

XXXX is the baud rate in hexidecimal
YY is the signal sent (for example: 7F)
AA is the expected bits in error, this should always read 00
ZZ is the signal received
BB is the bits in error.

Disk Menu

The Disk Menu may be obtained from the general menu by pressing F3. The Disk Menu is an optional menu and will only appear if Option 42 or 43 is installed. As Self Test checked out the electronics of the Disk Controller board, this routine is used to check the drive itself. This routine is useful for checking head alignment of the disk drives. An alignment procedure for the drives, using these routines, is found in the 4110 Series F42/43 Disk Options Service Manual. All routines on the Disk Menu are self explanitory. An example of the Disk Menu follows:

```
Disk Menu
--
f1 No Operation
f2 Step up One Track
f3 Step Down One Track
f4 Seek Track 0
f5 Seek Track 1
f6 Seek Track 38
f7 Seek Track 75
f8 Seek Track 76
Sh f1 Load Head
Sh f2 Unload Head
Sh f3 Arms Write Mode
Sh f4 Writes Track 76 With a 2F Pattern
Sh f5 Select Your Own Track
Sh f6 Change Device (Drive Unit) Address
Sh f7 Auto Load And Unload The Head On Track 0
--
Selection
*
```

3PPI Menu

The key designation to select the 3PPI option from the general menu will depend on the options installed. If no disk or tablet options are installed, the F3 key will select the 3PPI Menu from the general menu. An example of this menu follows:

```
3PPI Menu
--
f1 3PPI Ports
--
Selection
*
```

This routine is designed to check the cables to the peripheral port designated. In order to start the test, press F1. The following will show on the screen:

```
*f1
Select Port (0, 1 or 2)
*
```

Connect the terminal host port cable to the port to be tested. Then type the number of the port to be tested (0, 1, or 2) followed by a RETURN. If there are any errors in the test, the following submessage may appear:

"3PPI-Baud/Character
Sent: XXXX Expect: YY-ZZ Receive: AA-BB"

Explanation:
The baud rate was set to XXXX (a hexidecimal code). During the test, the character sent was YY (also a hexidecimal code). The character received was ZZ (hex). Interrupt bits expected are ZZ (00), what was received was BB.

If there are no errors found in the test, a prompt will appear on the screen.

Tablet Menu

When the Tablet is selected from the gereral menu, the following tablet menu will appear on the screen:

```
Tablet Menu
--
f1 Tablet Timing Adjustment
--
Selection
*
```

At this time, the interconnect cable must be connected between the graphic tablet and the graphic tablet port. Once this is done, the F1 key can be pressed.

The following submessages can be used to aid in adjusting the surface accuracy of the tablets. For more information on tablet adjustments, consult the Option F13/14 Graphic Tablet Instruction manual.

Submessages: (printed on screen)

Warning: -Tablet Firing Sequence Error -

The status bits which indicate which data firing (X1, X2, Y1, Y2) is being received are out of sequence. This is a warning only; the routine will proceed normally. This message can indicate a problem on any of the circuit boards associated with the tablet.

X = NNN.NNN Y = NNN.NNN Button = N Using a Cursor
Pen

This is the standard message. It is displayed whenever the Z-axis switch is depressed while in presence. It displays X and Y in inches from the margin, the button number depressed (0 for stylus; Z, 1, 2, 3 for a cursor.) It also indicates whether a pen (stylus) or cursor is in use

X Timing Straps = NNNNNNNN Y Timing Straps = NNNNNNNN

This message is printed whenever a Z-axis switch is depressed with the stylus out of presence. It is a binary readout of the timing strap settings. A comparison of this readout with the actual strap settings will verify the proper operation of the timing straps.

Appendix E

INSTALLING OPTIONAL KEYBOARDS

Four optional keyboards are available for the terminal. These are:

- Option 4A: United Kingdom Keyboard.
- Option 4C: Swedish Keyboard.
- Option 4E: APL Keyboard.
- Option 4F: Danish/Norwegian Keyboard.

To change a standard (North American) keyboard to one of the optional keyboards requires three basic steps:

1. Installing the keyboard ROMs in the RAM/ROM board.
2. Cutting straps on the keyboard circuit board to match the requirements of the new operating language.
3. Changing keys on the keyboard.

Installing Keyboard ROMs

The standard keyboard requires no ROMs in the keyboard ROM position on the RAM/ROM board. If any of the keyboard options are installed, the keyboard ROMs must also be installed. One pair of ROMs are required, and this pair contains the firmware for all four of the keyboard options. This pair of ROMs is placed in the upper lefthand corner of the RAM/ROM board (see Figure E-1). The Tektronix part number for the keyboard ROMs are:

Most Significant Byte	160-0983-01
Least Significant Byte	160-0982-01

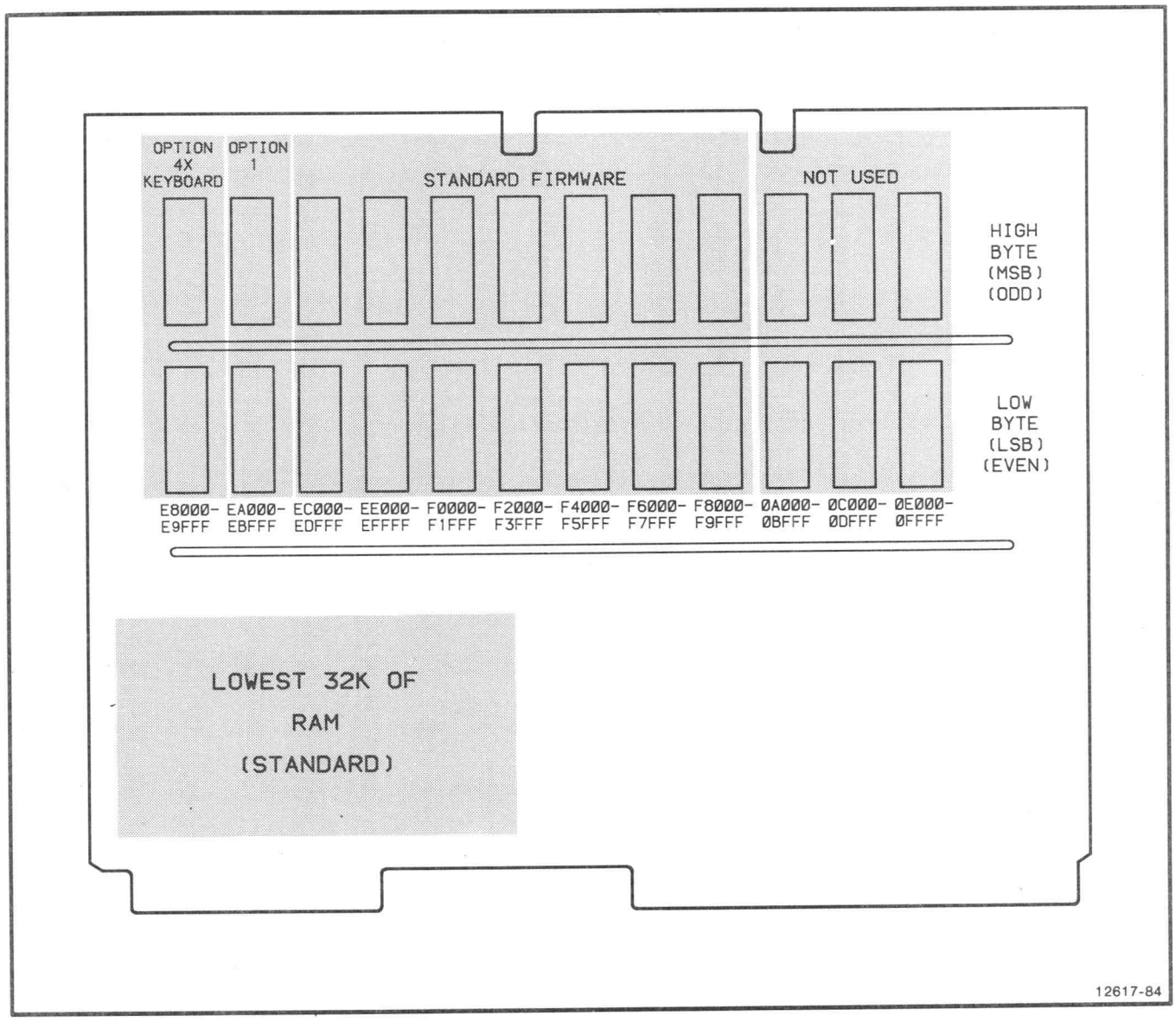

Figure E-1. RAM/ROM Board.

Cutting the Keyboard Straps

The keyboard has a set of cut straps that allows the firmware to interpret key strokes according to languages other than English. The strap consists of four individual cut straps labeled E1 through E4 (see Schematic A3-1). The combination of these straps are read as one hexadecimal number which corresponds to certain keyboard options. See Table E-1.

Table E-1

KEYBOARD LANGUAGE OPTION STRAPS

Language	Option Number	Open Cut Strap	Hex Code
Standard	--	none	00
United Kingdom	4A	E4	08
Swedish	4C	E2	02
APL	4E	E1	01
Danish/Norwegian	4F	E2 & E3	06

Replacing the Keyboard Keys

Options 4A, 4C, 4E, and 4F all require new keyboard keys. Figures E-2 through E-5 show these new keys (as unshaded). Tables E-2 through E-6 show the new code conversion charts.

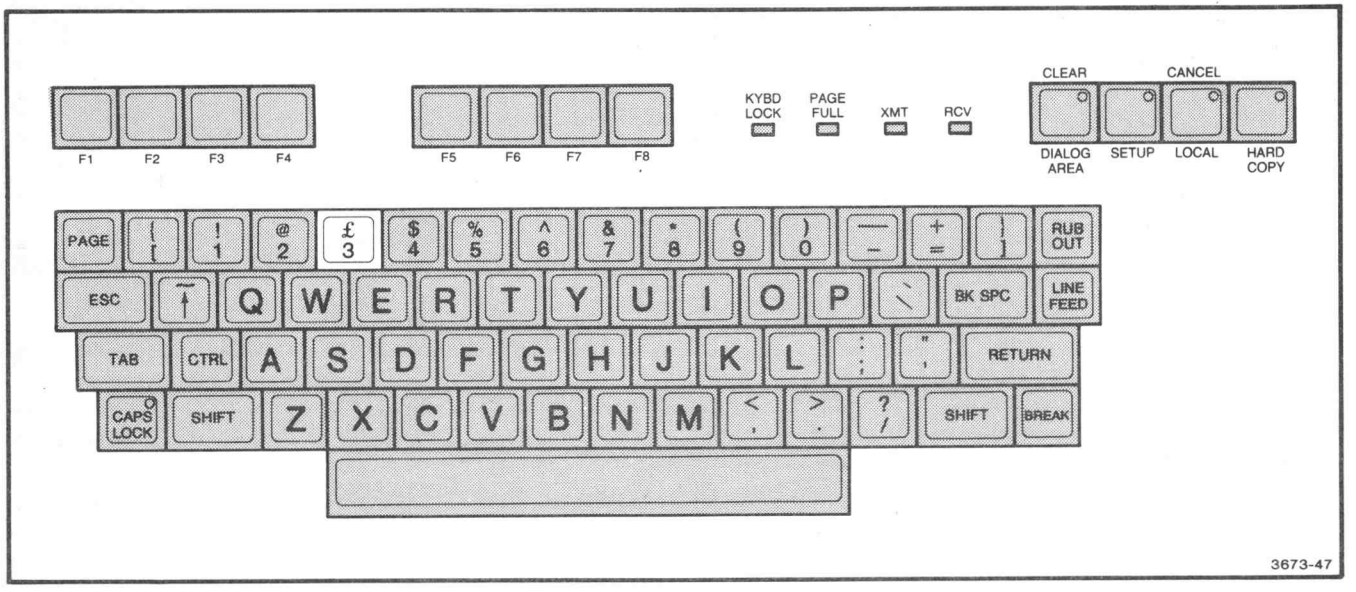

Figure E-2. United Kingdom Keyboard.

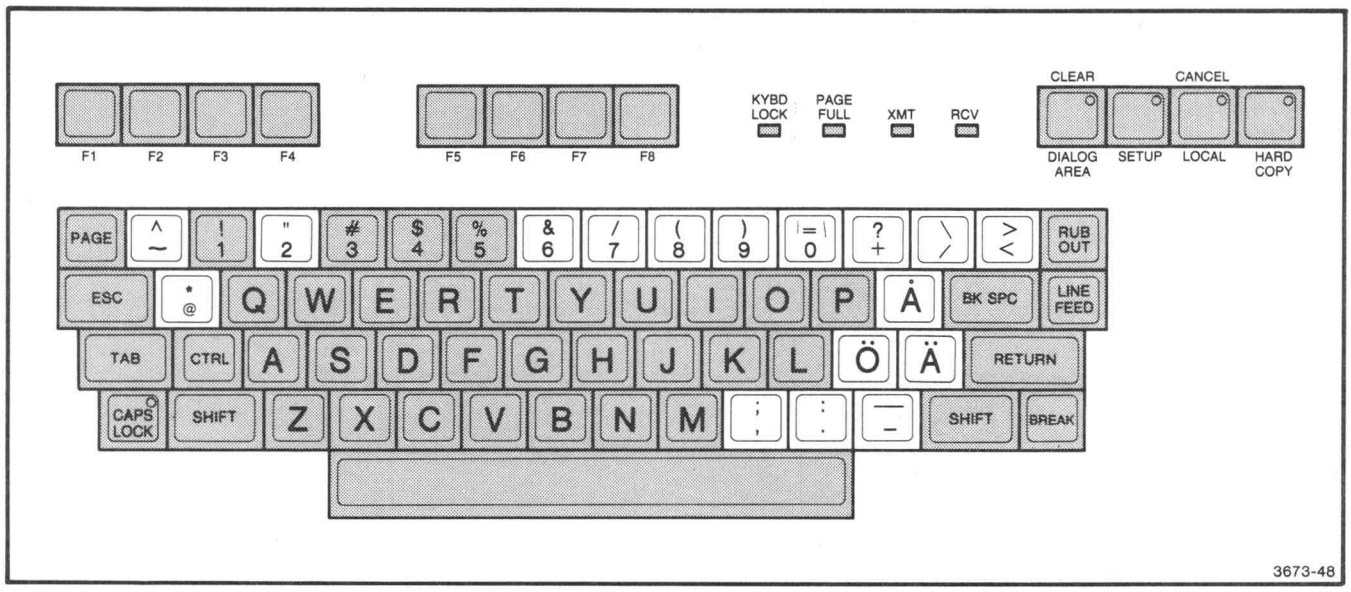

Figure E-3. Swedish Keyboard.

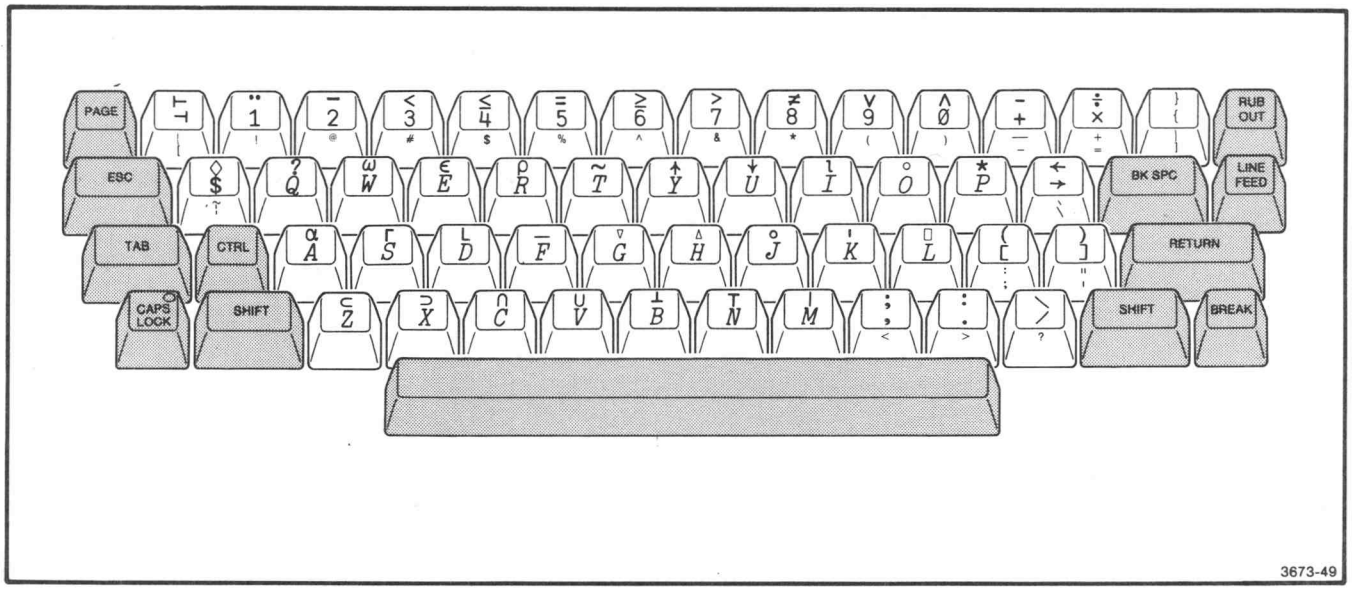

Figure E-4. APL Keyboard.

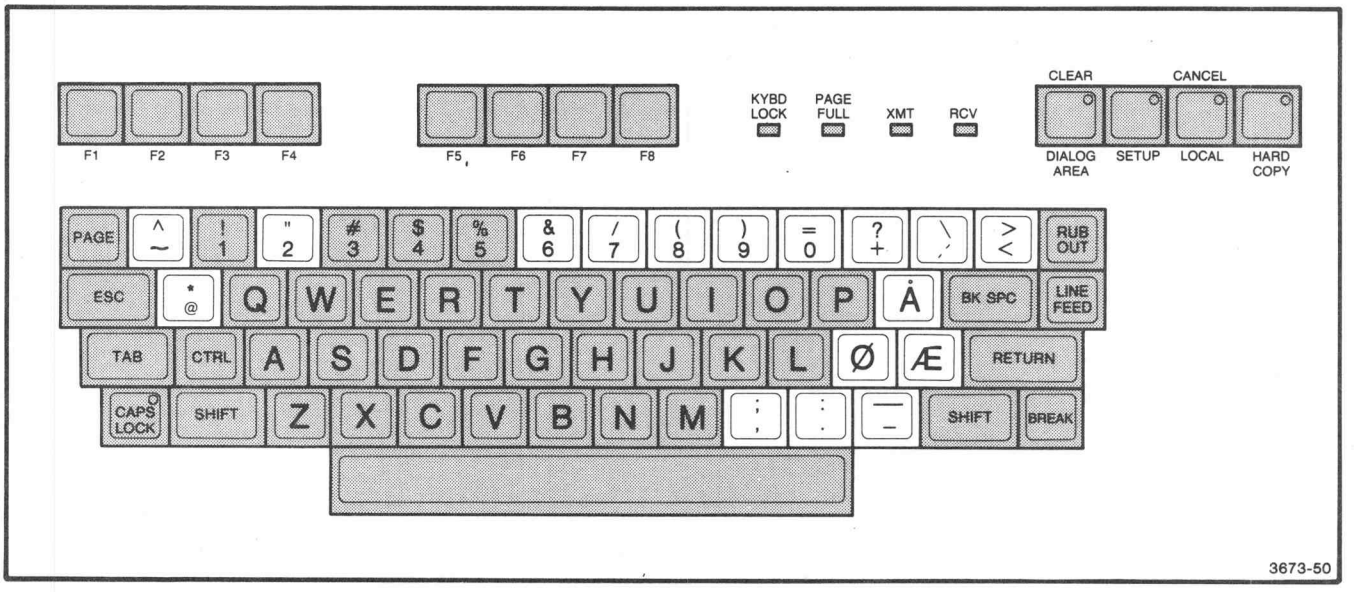

Figure E-5. Danish/Norwegian Keyboard.

Table E-2

UNITED KINGDOM CHARACTER SET

BITS B4 B3 B2 B1	B7 B6 B5 Ø Ø Ø	Ø Ø 1	Ø 1 Ø	Ø 1 1	1 Ø Ø	1 Ø 1	1 1 Ø	1 1 1
	CONTROL		HIGH X & Y GRAPHIC INPUT		LOW X		LOW Y	
Ø Ø Ø Ø	NUL 0	DLE 16	SP 32	0 48	@ 64	P 80	\ 96	p 112
Ø Ø Ø 1	SOH 1	DC1 17	! 33	1 49	A 65	Q 81	a 97	q 113
Ø Ø 1 Ø	STX 2	DC2 18	" 34	2 50	B 66	R 82	b 98	r 114
Ø Ø 1 1	ETX 3	DC3 19	£ 35	3 51	C 67	S 83	c 99	s 115
Ø 1 Ø Ø	EOT 4	DC4 20	$ 36	4 52	D 68	T 84	d 100	t 116
Ø 1 Ø 1	ENQ 5	NAK 21	% 37	5 53	E 69	U 85	e 101	u 117
Ø 1 1 Ø	ACK 6	SYN 22	& 38	6 54	F 70	V 86	f 102	v 118
Ø 1 1 1	BEL BELL 7	ETB 23	' 39	7 55	G 71	W 87	g 103	w 119
1 Ø Ø Ø	BS BACK-SPACE 8	CAN 24	(40	8 56	H 72	X 88	h 104	x 120
1 Ø Ø 1	HT 9	EM 25	) 41	9 57	I 73	Y 89	i 105	y 121
1 Ø 1 Ø	LF 10	SUB 26	* 42	: 58	J 74	Z 90	j 106	z 122
1 Ø 1 1	VT 11	ESC 27	+ 43	; 59	K 75	[91	k 107	{ 123
1 1 Ø Ø	FF 12	FS 28	, 44	< 60	L 76	\ 92	l 108	| * 124
1 1 Ø 1	CR RETURN 13	GS 29	- 45	= 61	M 77	] 93	m 109	} 125
1 1 1 Ø	SO 14	RS 30	. 46	> 62	N 78	^ 94	n 110	~ 126
1 1 1 1	SI 15	US 31	/ 47	? 63	O 79	_ 95	o 111	RUBOUT (DEL) 127

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Table E-3

SWEDISH CHARACTER SET

BITS B4 B3 B2 B1	B7 B6 B5 Ø Ø Ø	Ø Ø 1	Ø 1 Ø	Ø 1 1	1 Ø Ø	1 Ø 1	1 1 Ø	1 1 1
	CONTROL		HIGH X & Y GRAPHIC INPUT		LOW X		LOW Y	
Ø Ø Ø Ø	NUL 0	DLE 16	SP 32	0 48	@ 64	P 80	\ 96	p 112
Ø Ø Ø 1	SOH 1	DC1 17	! 33	1 49	A 65	Q 81	a 97	q 113
Ø Ø 1 Ø	STX 2	DC2 18	" 34	2 50	B 66	R 82	b 98	r 114
Ø Ø 1 1	ETX 3	DC3 19	# 35	3 51	C 67	S 83	c 99	s 115
Ø 1 Ø Ø	EOT 4	DC4 20	$ 36	4 52	D 68	T 84	d 100	t 116
Ø 1 Ø 1	ENQ 5	NAK 21	% 37	5 53	E 69	U 85	e 101	u 117
Ø 1 1 Ø	ACK 6	SYN 22	& 38	6 54	F 70	V 86	f 102	v 118
Ø 1 1 1	BEL BELL 7	ETB 23	' 39	7 55	G 71	W 87	g 103	w 119
1 Ø Ø Ø	BS BACK-SPACE 8	CAN 24	(40	8 56	H 72	X 88	h 104	x 120
1 Ø Ø 1	HT 9	EM 25	) 41	9 57	I 73	Y 89	i 105	y 121
1 Ø 1 Ø	LF 10	SUB 26	* 42	: 58	J 74	Z 90	j 106	z 122
1 Ø 1 1	VT 11	ESC 27	+ 43	; 59	K 75	Ä 91	k 107	ä 123
1 1 Ø Ø	FF 12	FS 28	, 44	< 60	L 76	Ö 92	l 108	ö 124
1 1 Ø 1	CR RETURN 13	GS 29	- 45	= 61	M 77	Å 93	m 109	å 125
1 1 1 Ø	SO 14	RS 30	. 46	> 62	N 78	^ 94	n 110	~ 126
1 1 1 1	SI 15	US 31	/ 47	? 63	O 79	_ 95	o 111	RUBOUT (DEL) 127

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Table E-4

ASCII CODE CHART

B7 B6 B5 / BITS B4 B3 B2 B1	Ø Ø Ø	Ø Ø 1	Ø 1 Ø	Ø 1 1	1 Ø Ø	1 Ø 1	1 1 Ø	1 1 1
	CONTROL		HIGH X & Y GRAPHIC INPUT		LOW X		LOW Y	
Ø Ø Ø Ø	NUL 0	DLE 16	SP 32	0 48	@ 64	P 80	\ 96	p 112
Ø Ø Ø 1	SOH 1	DC1 17	! 33	1 49	A 65	Q 81	a 97	q 113
Ø Ø 1 Ø	STX 2	DC2 18	" 34	2 50	B 66	R 82	b 98	r 114
Ø Ø 1 1	ETX 3	DC3 19	# 35	3 51	C 67	S 83	c 99	s 115
Ø 1 Ø Ø	EOT 4	DC4 20	$ 36	4 52	D 68	T 84	d 100	t 116
Ø 1 Ø 1	ENQ 5	NAK 21	% 37	5 53	E 69	U 85	e 101	u 117
Ø 1 1 Ø	ACK 6	SYN 22	& 38	6 54	F 70	V 86	f 102	v 118
Ø 1 1 1	BEL BELL 7	ETB 23	' 39	7 55	G 71	W 87	g 103	w 119
1 Ø Ø Ø	BS BACK-SPACE 8	CAN 24	(40	8 56	H 72	X 88	h 104	x 120
1 Ø Ø 1	HT 9	EM 25	) 41	9 57	I 73	Y 89	i 105	y 121
1 Ø 1 Ø	LF 10	SUB 26	* 42	: 58	J 74	Z 90	j 106	z 122
1 Ø 1 1	VT 11	ESC 27	+ 43	; 59	K 75	[91	k 107	{ 123
1 1 Ø Ø	FF 12	FS 28	, 44	< 60	L 76	\ 92	l 108	| * 124
1 1 Ø 1	CR RETURN 13	GS 29	- 45	= 61	M 77	] 93	m 109	} 125
1 1 1 Ø	SO 14	RS 30	. 46	> 62	N 78	^ 94	n 110	~ 126
1 1 1 1	SI 15	US 31	/ 47	? 63	O 79	_ 95	o 111	RUBOUT (DEL) 127

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Table E-5

APL CHARACTER SET

BITS B4 B3 B2 B1	B7 B6 B5 = 0 0 0	0 0 1	0 1 0	0 1 1	1 0 0	1 0 1	1 1 0	1 1 1
	CONTROL		HIGH X & Y GRAPHIC INPUT		LOW X		LOW Y	
0 0 0 0	NUL 0	DLE 16	SP 32	0 48	¯ 64	* 80	◇ 96	*P* 112
0 0 0 1	SOH 1	DC1 17	•• 33	1 49	α 65	? 81	*A* 97	*Q* 113
0 0 1 0	STX 2	DC2 18	) 34	2 50	⊥ 66	ρ 82	*B* 98	*R* 114
0 0 1 1	ETX 3	DC3 19	< 35	3 51	∩ 67	⌈ 83	*C* 99	*S* 115
0 1 0 0	EOT 4	DC4 20	≤ 36	4 52	⌊ 68	~ 84	*D* 100	*T* 116
0 1 0 1	ENQ 5	NAK 21	= 37	5 53	∈ 69	↓ 85	*E* 101	*U* 117
0 1 1 0	ACK 6	SYN 22	> 38	6 54	⍴ 70	∪ 86	*F* 102	*V* 118
0 1 1 1	BEL BELL 7	ETB 23	] 39	7 55	∇ 71	ω 87	*G* 103	*W* 119
1 0 0 0	BS BACK-SPACE 8	CAN 24	∨ 40	8 56	Δ 72	⊃ 88	*H* 104	*X* 120
1 0 0 1	HT 9	EM 25	∧ 41	9 57	⍳ 73	↑ 89	*I* 105	*Y* 121
1 0 1 0	LF 10	SUB 26	≠ 42	(58	○ 74	⊂ 90	*J* 106	*Z* 122
1 0 1 1	VT 11	ESC 27	÷ 43	[59	⍲ 75	← 91	*K* 107	{ 123
1 1 0 0	FF 12	FS 28	, 44	; 60	⍞ 76	⊢ 92	*L* 108	⊣ 124
1 1 0 1	CR RETURN 13	GS 29	+ 45	× 61	| 77	→ 93	*M* 109	} 125
1 1 1 0	SO 14	RS 30	. 46	: 62	⍑ 78	≥ 94	*N* 110	$ 126
1 1 1 1	SI 15	US 31	/ 47	\ 63	○ 79	- 95	*O* 111	RUBOUT (DEL) 127

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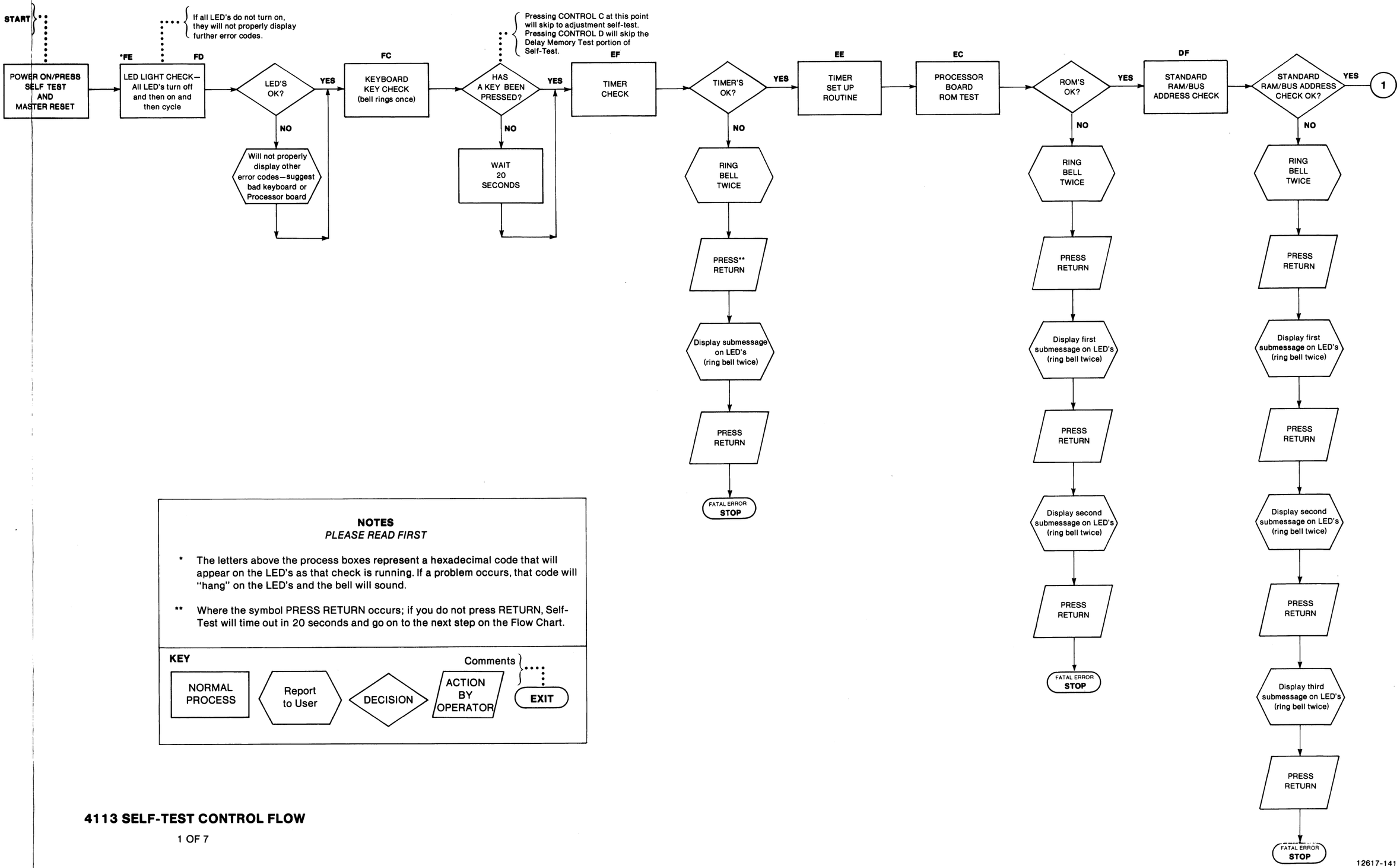
Table E-6

DANISH/NORWEGIAN CHARACTER SET

BITS B4 B3 B2 B1	B7 B6 B5 = Ø Ø Ø	Ø Ø 1	Ø 1 Ø	Ø 1 1	1 Ø Ø	1 Ø 1	1 1 Ø	1 1 1
	CONTROL		HIGH X & Y GRAPHIC INPUT		LOW X		LOW Y	
Ø Ø Ø Ø	NUL 0	DLE 16	SP 32	0 48	@ 64	P 80	\ 96	p 112
Ø Ø Ø 1	SOH 1	DC1 17	! 33	1 49	A 65	Q 81	a 97	q 113
Ø Ø 1 Ø	STX 2	DC2 18	" 34	2 50	B 66	R 82	b 98	r 114
Ø Ø 1 1	ETX 3	DC3 19	# 35	3 51	C 67	S 83	c 99	s 115
Ø 1 Ø Ø	EOT 4	DC4 20	$ 36	4 52	D 68	T 84	d 100	t 116
Ø 1 Ø 1	ENQ 5	NAK 21	% 37	5 53	E 69	U 85	e 101	u 117
Ø 1 1 Ø	ACK 6	SYN 22	& 38	6 54	F 70	V 86	f 102	v 118
Ø 1 1 1	BEL BELL 7	ETB 23	' 39	7 55	G 71	W 87	g 103	w 119
1 Ø Ø Ø	BS BACK-SPACE 8	CAN 24	(40	8 56	H 72	X 88	h 104	x 120
1 Ø Ø 1	HT 9	EM 25	) 41	9 57	I 73	Y 89	i 105	y 121
1 Ø 1 Ø	LF 10	SUB 26	* 42	: 58	J 74	Z 90	j 106	z 122
1 Ø 1 1	VT 11	ESC 27	+ 43	; 59	K 75	Ä Æ 91	k 107	ä æ 123
1 1 Ø Ø	FF 12	FS 28	, 44	< 60	L 76	Ø 92	l 108	ø 124
1 1 Ø 1	CR RETURN 13	GS 29	- 45	= 61	M 77	Å 93	m 109	å 125
1 1 1 Ø	SO 14	RS 30	. 46	> 62	N 78	^ 94	n 110	~ 126
1 1 1 1	SI 15	US 31	/ 47	? 63	O 79	_ 95	o 111	RUBOUT (DEL) 127

3673-55


START
POWER ON/PRESS SELF TEST AND MASTER RESET
*FE
LED LIGHT CHECK— All LED's turn off and then on and then cycle
If all LED's do not turn on, they will not properly display further error codes.
FD
LED'S OK?
YES
NO
Will not properly display other error codes—suggest bad keyboard or Processor board
FC
KEYBOARD KEY CHECK (bell rings once)
HAS A KEY BEEN PRESSED?
Pressing CONTROL C at this point will skip to adjustment self-test. Pressing CONTROL D will skip the Delay Memory Test portion of Self-Test.
WAIT 20 SECONDS
EF
TIMER CHECK
TIMER'S OK?
RING BELL TWICE
PRESS** RETURN
Display submessage on LED's (ring bell twice)
PRESS RETURN
FATAL ERROR STOP
EE
TIMER SET UP ROUTINE
EC
PROCESSOR BOARD ROM TEST
ROM'S OK?
RING BELL TWICE
PRESS RETURN
Display first submessage on LED's (ring bell twice)
PRESS RETURN
Display second submessage on LED's (ring bell twice)
PRESS RETURN
FATAL ERROR STOP
DF
STANDARD RAM/BUS ADDRESS CHECK
STANDARD RAM/BUS ADDRESS CHECK OK?
1
RING BELL TWICE
PRESS RETURN
Display first submessage on LED's (ring bell twice)
PRESS RETURN
Display second submessage on LED's (ring bell twice)
PRESS RETURN
Display third submessage on LED's (ring bell twice)
PRESS RETURN
FATAL ERROR STOP

NOTES
PLEASE READ FIRST

* The letters above the process boxes represent a hexadecimal code that will appear on the LED's as that check is running. If a problem occurs, that code will "hang" on the LED's and the bell will sound.

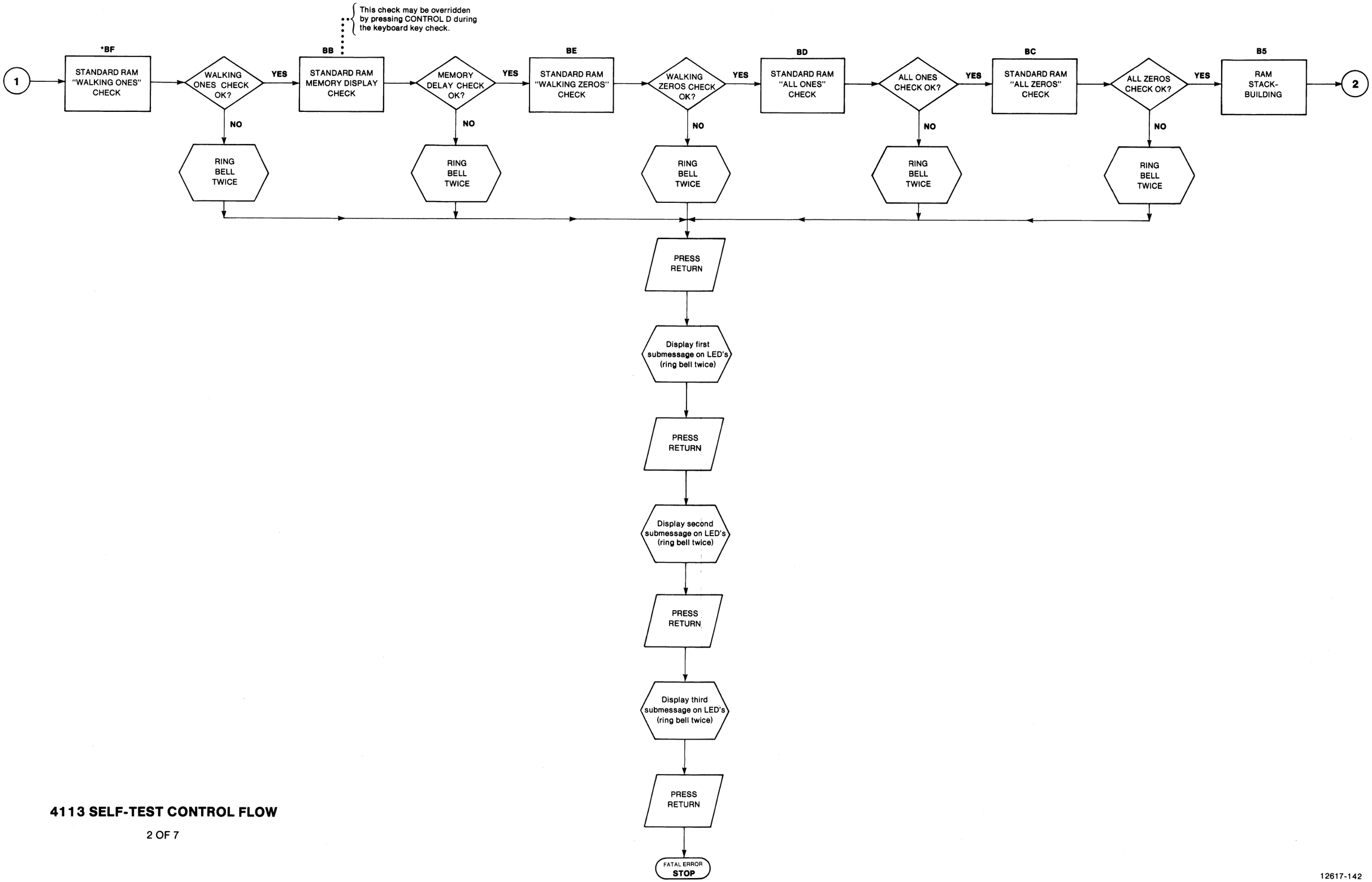
** Where the symbol PRESS RETURN occurs; if you do not press RETURN, Self-Test will time out in 20 seconds and go on to the next step on the Flow Chart.

KEY

4113 SELF-TEST CONTROL FLOW

1 OF 7

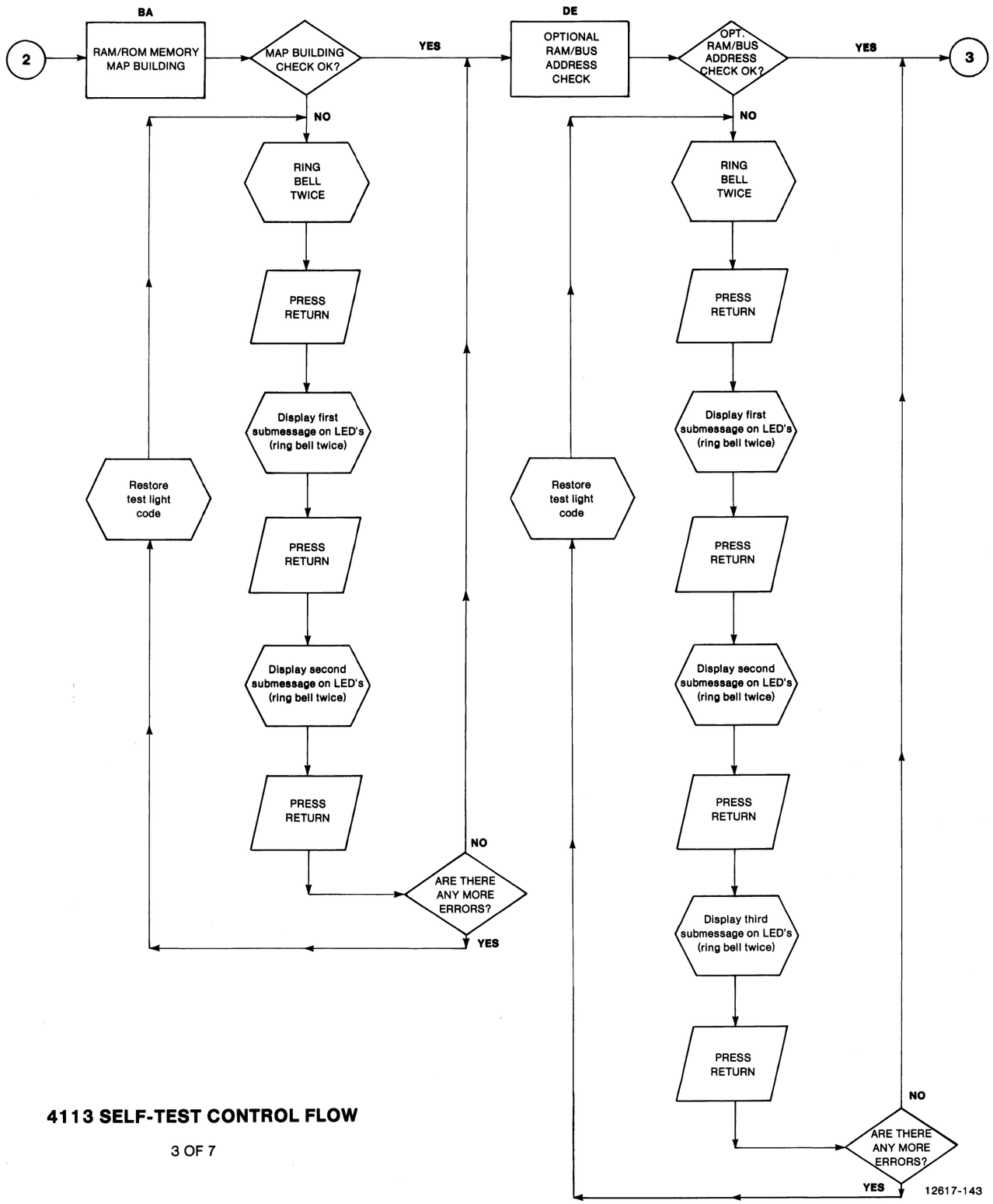
12617-141



4113 SELF-TEST CONTROL FLOW

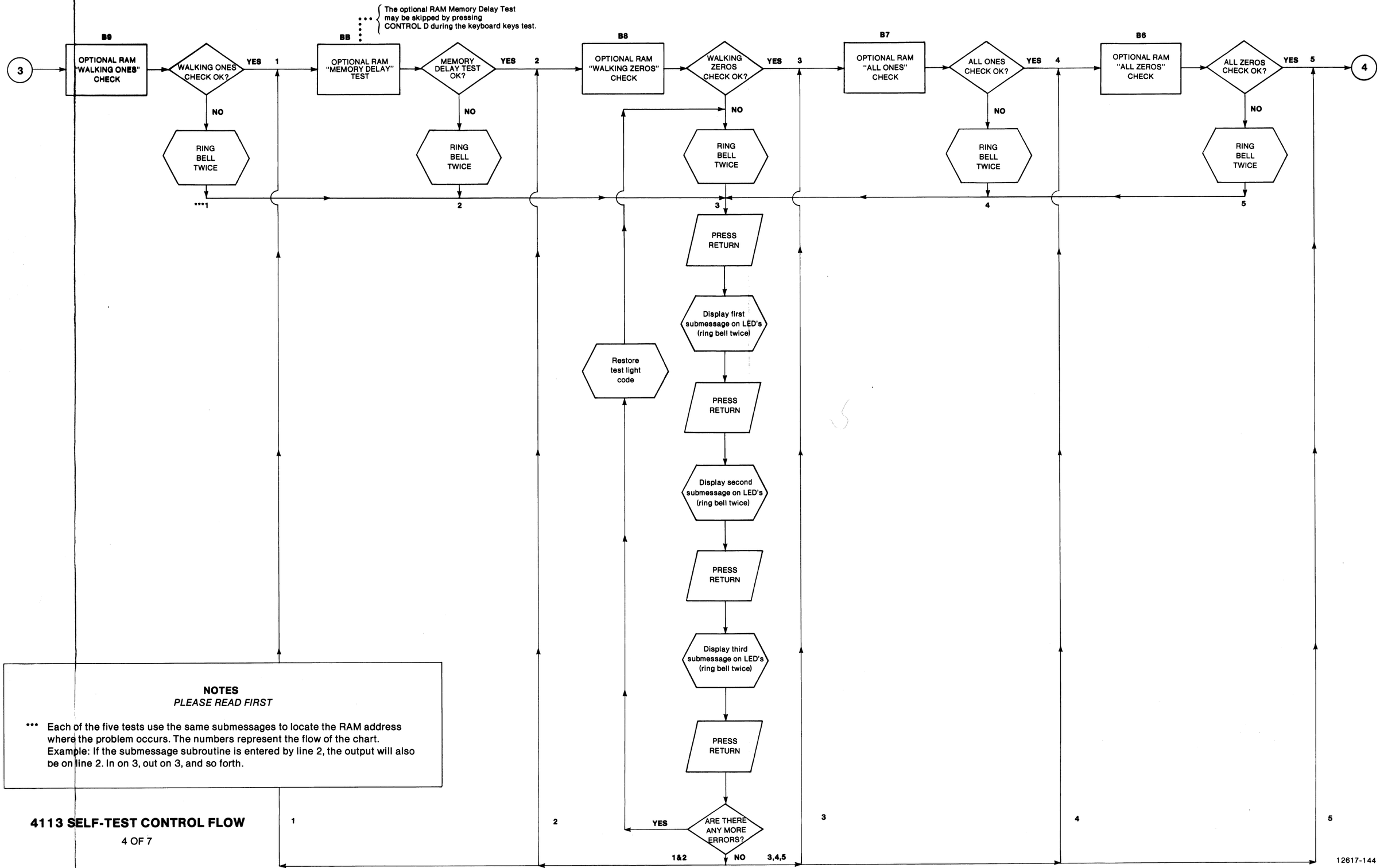
2 OF 7

12617-142



4113 SELF-TEST CONTROL FLOW

3 OF 7



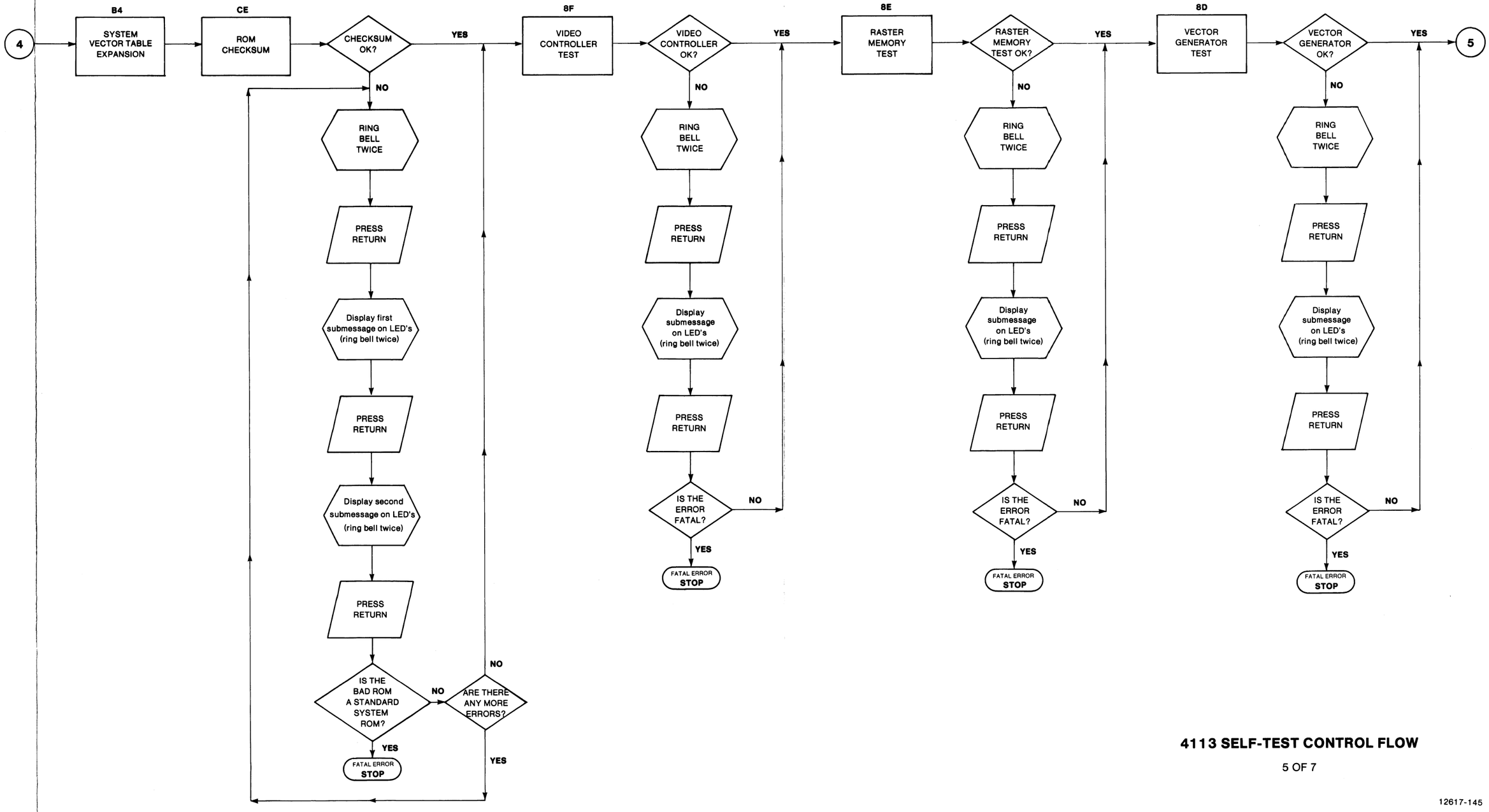
NOTES
PLEASE READ FIRST

*** Each of the five tests use the same submessages to locate the RAM address where the problem occurs. The numbers represent the flow of the chart. Example: If the submessage subroutine is entered by line 2, the output will also be on line 2. In on 3, out on 3, and so forth.

4113 SELF-TEST CONTROL FLOW

4 OF 7

12617-144



4113 SELF-TEST CONTROL FLOW

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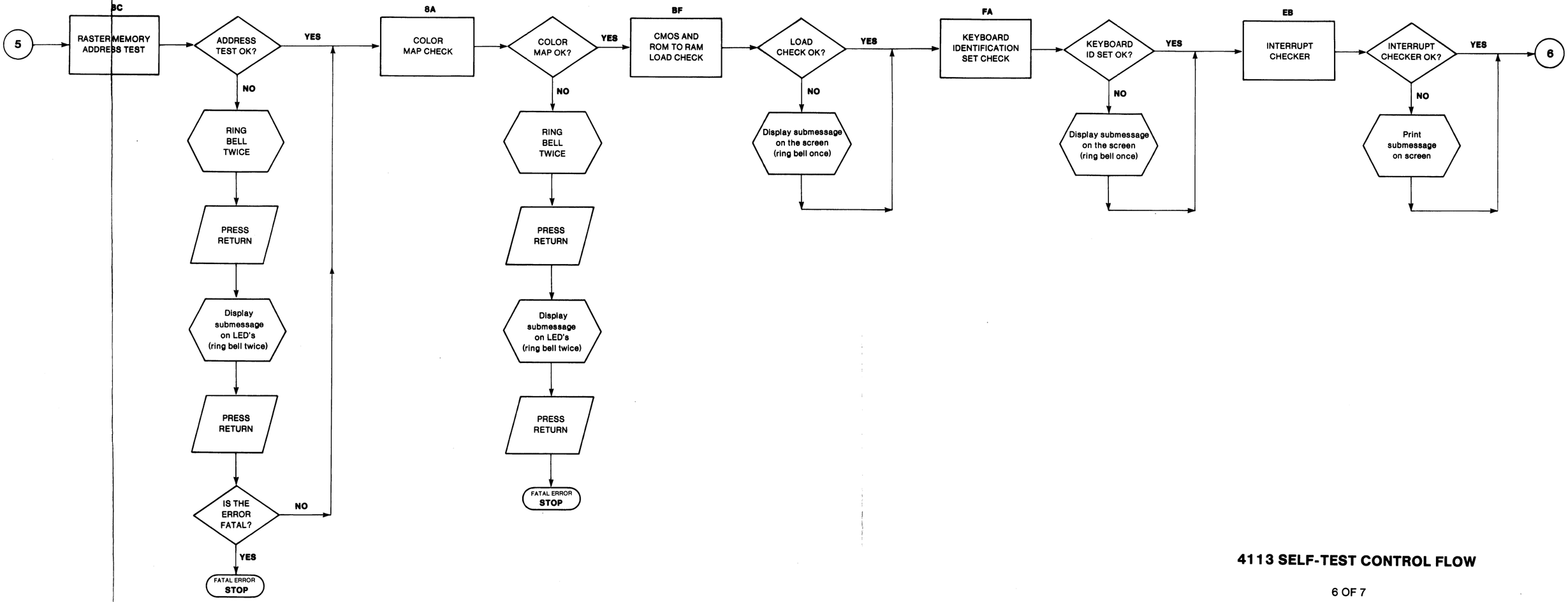
12617-145



4113 SELF-TEST CONTROL FLOW

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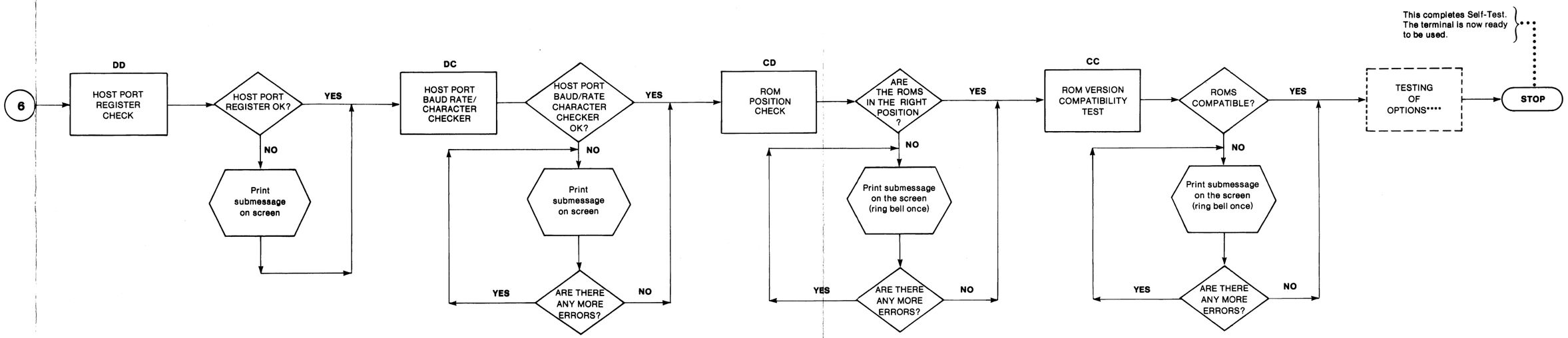
4113 SELF-TEST
FIGURE D-1F



NOTES
PLEASE READ FIRST

**** If any options are installed in the terminal, they will be tested at this point (except RAM options, which were tested earlier). The option boards tested include the Disk Controller board, 3 PPI board, and Tablet Controller board. Tests on these boards are performed in descending sequence of the hexadecimal error codes.

4113 SELF-TEST CONTROL FLOW

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12617-147